Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

November, 1933

Freedom of the Press

AS journalists we are naturally concerned about the threat of restrictions on what we like to look upon as the "freedom of the press." We are, of course, unalterably opposed to any form of licensing or regulation which will have the effect of limiting our right to the free expression of our opinions and which would tend to make us the tool or organ of special interests whether commercial or political.

When members of the press talk of freedom of the press they mean freedom from political—that is to say, governmental—supervision. As a class they appear to have no objection to dominance by commercial interests, which exact a conformity fully as harsh as any imposed by government. The political type appears to be a particularly offensive form, possibly because it has none of the compensatory commercial advantages inherent in supervision by business.

In theory freedom of the press means the right to say what one likes; in practice it too often means the right to refrain from saying what one would like to say or what one should say. The right called freedom of the press is more often exercised by omission than by commission. It has become, therefore, more of a negative right than a positive one.

The newspaper which voices its convictions regardless of whatever damage may accrue to it is exercising its right of freedom of the press through an act of commission; the one which stifles an opinion or a piece of news because of the fear of hurting its commercial interest exercises its right by withholding action. The newspaper which refuses to print the news of an elevator accident in the department store of one of its advertisers, or which ignores news of a commendatory nature regarding a politician who is not allied to it, or which neglects to treat subjects which it knows are the center of strong opinions among large sections of its readers probably prides itself quite as much on its "freedom" as the one which pursues the opposite course. The attitude of many large newspapers toward such important public questions as crime, unemployment, prohibition, public morals, and the like, while technically in conformity with the theory of freedom of the press, is in reality an abuse of the right.

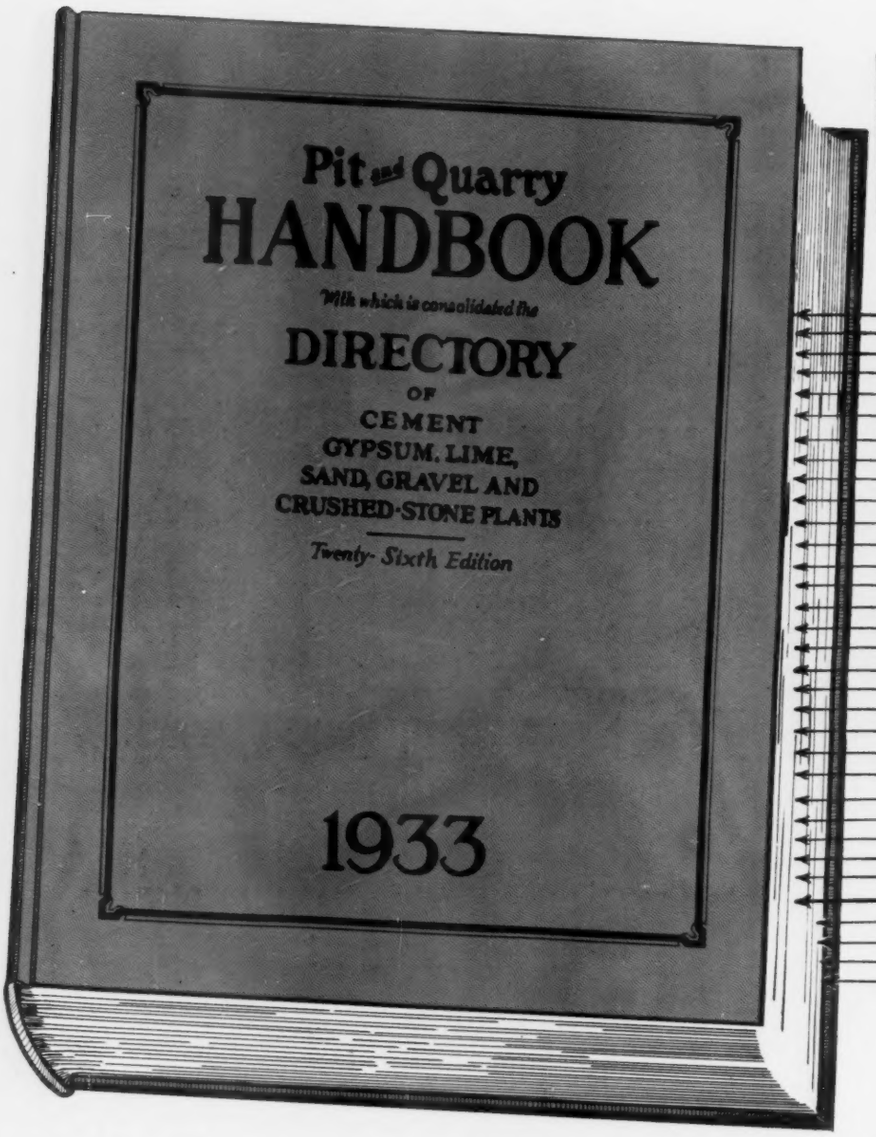
We, therefore, in common with numerous other journalists, would like to see a clarification of the freedom-of-the-press issue. If greater freedom for the untrammeled expression of useful opinion, for the honest portrayal of the news of the day, for the right to act independently of commercial, political and other forms of coercion is sought, we share the wish. But if freedom of the press is to mean, as it too often does, the right to suppress as well as to express, to support antisocial as well as social causes, to protect and abet corruption in business and politics, we demur. We believe this is the attitude of sanity and right.

Pages 11-15

Since 1929 the largest net paid A. B. C. producer circulation in the field

TN1
.P65

With a Revival of Business You Need New Prospect Lists



226 pages of this book are devoted to an alphabetical and a geographical list of producers of Cement, Gypsum, Lime, Sand, Gravel, Crushed Stone and other non-metallic mineral producers.

- Prospecting and Evaluating
- Plant Design
- Hydraulicking and Dredging
- Dry Removal of Overburden
- Drilling
- Blasting
- Water Pumping
- Excavating and Loading
- Intraplant Transportation
- Crushing and Grinding
- Elevating and Conveying
- Screening, Classifying
- Washing
- Drying
- Slurry Pumping, Filtration
- Storage and Reclamation
- Burning and Cooling
- Waste-Heat Recovery
- The Hydration of Lime
- Dust Collection
- Packing and Loading
- Electrical Equipment
- Internal-Combustion Engines
- Power Transmission
- Lubrication
- Premixed Concrete
- Accident Prevention
- Statistics
- Directory
- Trade Organizations
- Trade Names
- Equipment Index, Buyers' Guide
- Index to Advertisers

Buying is now being done—orders are coming in. Salesmen are making commissions—advertising in all forms shows more inquiries. How much work have you done on your prospect lists in the past two years? If it's anywhere near like most other lists it can be thrown away, for it is of little value.

Every name in Pit and Quarry Directory was checked just before publication. It is absolutely up to the minute. The lists are both alphabetical by company name and geographical by plants and main offices. Not having these lists will cost you time, labor, and money. Having them means economy of effort, and a sales campaign—mail and salesmen—that will shoot at the *real* prospect for the least expense. This list would be cheap at $100—and it costs only $10—get your copy today.

Delay Means Loss of Business—Send Order Now

PIT AND QUARRY PUBLICATIONS,
538 So. Clark St.,
Chicago, Illinois

Date.....

☐ Please send me.....copies of the 1933 Handbook and Directory (Price $10.00 per copy).

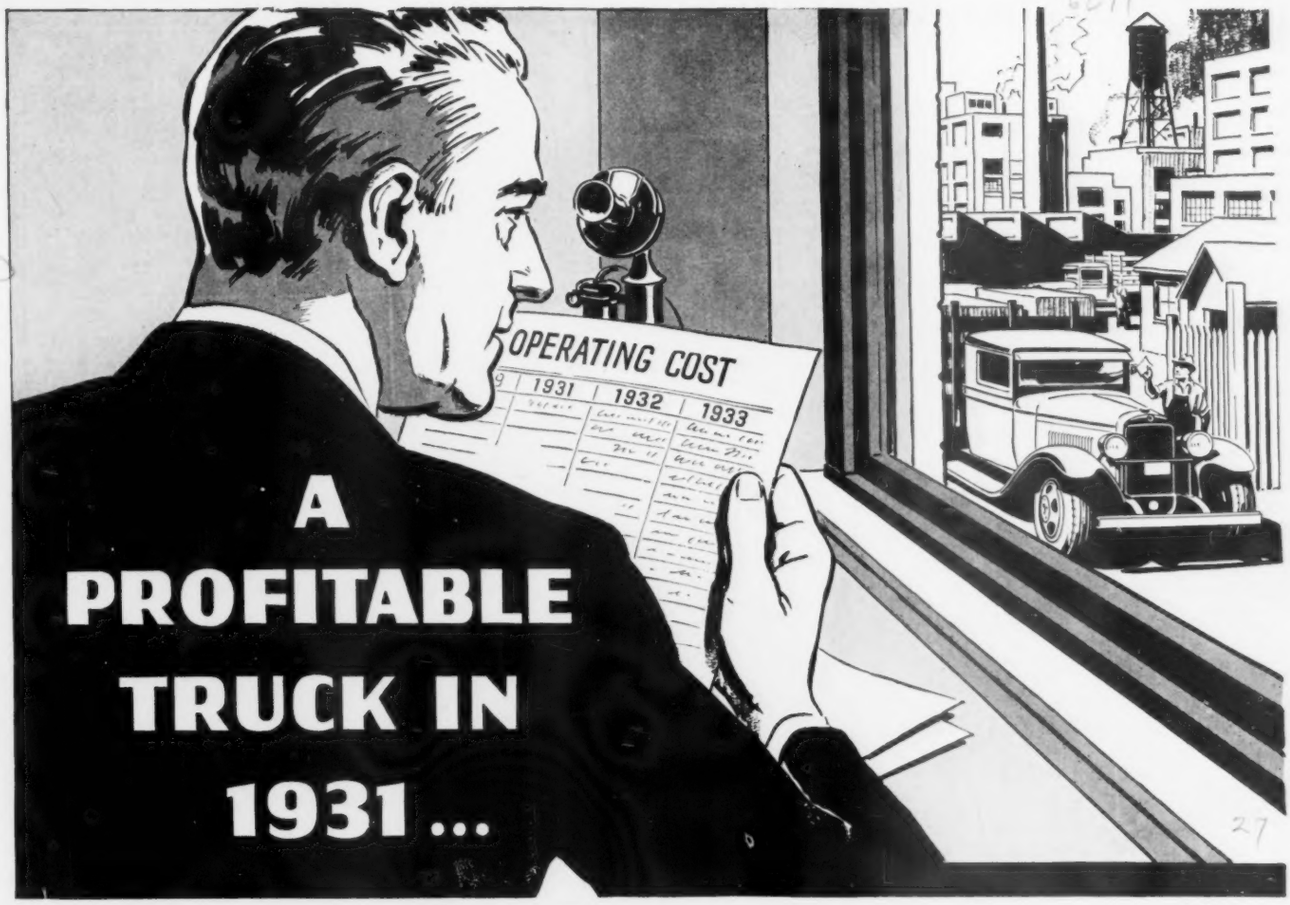
☐ Please send me.....copies of the 1933 Directory (Price $10.00 per copy).

☐ Remittance is enclosed. ☐ Will pay on receipt of invoice.

Name.....*Title*.....

Firm Name.....

Address.....*11-33*



A PROFITABLE TRUCK IN 1931...

....a liability today?

That truck of yours that seemed a good asset at the close of 1931 *may be losing money for you today!*

Check up—and see.

Re-figure your 1931 operating costs *in terms of 1933 dollars.* Keep in mind the effect on costs that today's new business conditions have. You'll certainly find that many items included under operating costs have moved sharply upward—more, perhaps, than you realize.

Then—still working with 1933 dollars—compare these corrected costs with those you would be paying if your trucks were *new.* Some of your present equipment will, unquestionably, bear the comparison well. But you may find other trucks in your fleet that you could trade-in with benefit to your purse!

That's where the GMC line enters into your problem.

The GMC Truck and Trailer line—produced by the world's largest builder of commercial vehicles exclusively—is so complete and varied that it fits *every* hauling requirement from 1½ to 22 tons. Each model, furthermore, has *proved* its ability to do its work at less cost per ton-mile.

GMC power plants—6-cylinder, valve-in-head engines of the most modern type—*all* develop *more sustained torque per cubic inch displacement* than any other engines in their field do. The line consists of *six* engines—truck-engineered and truck-built for truck work exclusively.

Finally, every GMC vehicle—because of the unmatched facilities of General Motors Truck Company—*is fitted exactly* to the job for which it is purchased.

So—if your examination of operating costs uncovers unprofitable equipment in your service, be sure to investigate, thoroughly, the GMC line!

GENERAL MOTORS TRUCKS and Trailers

GENERAL MOTORS TRUCK COMPANY — *Time Payments Available Through Our Own Y. M. A. C.* — PONTIAC, MICHIGAN

Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

Volume 26 November, 1933 Number 5

MEMBER AUDIT BUREAU OF CIRCULATIONS

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other non-metallic minerals. Entered as second-class matter November 28, 1932, at the Postoffice at Chicago, Ill., under the Act of March 3, 1879.

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NRA MEMBER U.S. WE DO OUR PART

Hoisting a New High Record!

● *Five years! More than double the service of any previous belt on the job!*

There's the record of a Goodyear Elevator Belt—specified to its duty by the G.T.M.—Goodyear Technical Man—on one of the hardest Connecticut trap rock jobs.

Took it off after hoisting 2,000,000 tons of 7-inch maximum lump, weighing approximately 175 lbs. per cubic foot.

You know how that kind of rock cuts in—abrasive, bruising, sharp.

This Goodyear Elevator Belt stood that gaff, 300 f.p.m. at 200 t.p.h. for *five* years and 2,000,000 tons!

Goodyear expects Goodyear Belts and other Goodyear Mechanical Rubber Goods to excel others of ordinary construction. This sort of record—typical as it is—confirms that expectation.

Don't you think you might save money by talking over your requirements with the G.T.M.?

You can get him through Goodyear, Akron, Ohio, or Los Angeles, California, or by calling your nearest Goodyear Mechanical Rubber Goods Distributor.

NRA MEMBER U.S. WE DO OUR PART

BELTS • MOLDED GOODS • HOSE • PACKING

Made by the Makers of GOODYEAR TIRES

Other G.T.M.-Specified Goodyear Products For Sand and Gravel, Rock and Cement Industries

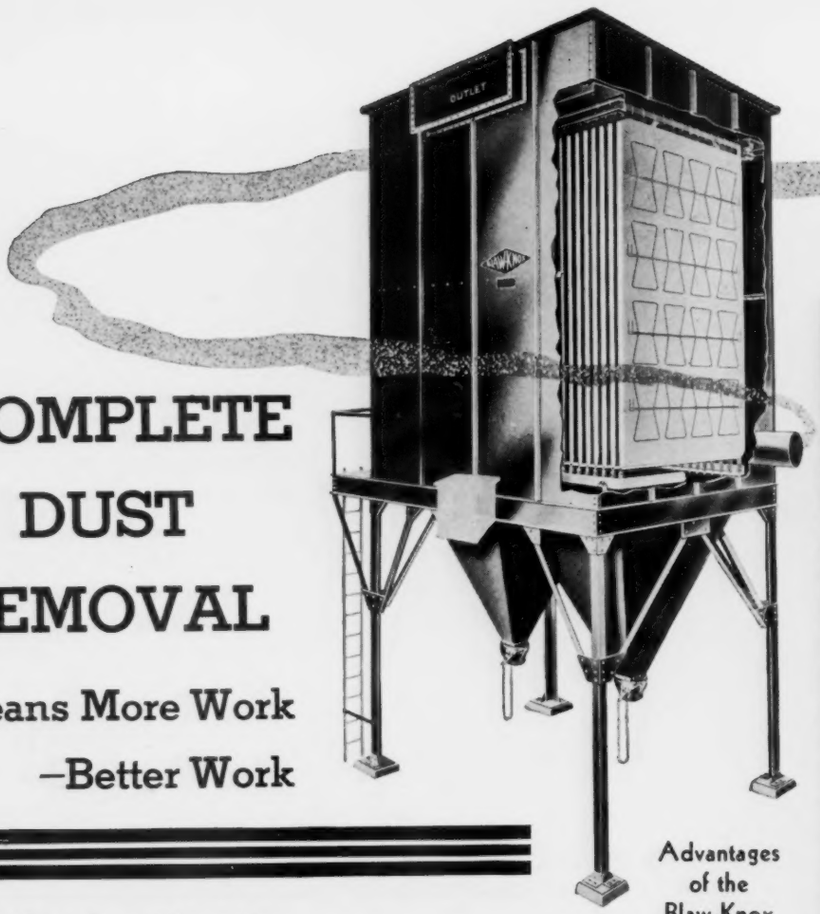
•

Sand Suction Hose
Dredging Sleeves
Conveyor Belts
Transmission Belts
Elevator Belts

THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS • MOLDED GOODS • HOSE • PACKING



COMPLETE DUST REMOVAL

means More Work —Better Work

The Grinding Hazard—

Blaw-Knox Steel Framed Bag Dust Collecting Systems are designed to meet all legal requirements, enabling foundries to comply with their state laws.

In the Sand Blast Room—

Blaw-Knox Dust Collecting Systems increase the visibility in the sand blast room. They clean the abrasive and prevent the spread of hazardous fines.

On the Shakeout Floor—

Increase mold permeability by controlled removal of fines and burnt sands and clays. Uncontrolled dust at the shakeouts is the largest source of foundry atmosphere contamination.

Let Blaw-Knox show you how to free your foundry from dust hazards, how your equipment can be modernized to make your foundry a safe working place. • Clean foundries make more and better castings for less money. • If you have a dust problem—Blaw-Knox can solve it.

BLAW-KNOX COMPANY
2080 Farmers Bank Building, Pittsburgh, Pa.
Offices in Principal Cities

Advantages of the Blaw-Knox DUST COLLECTOR

PROPERLY PLANNED AND ENGINEERED—
The Blaw-Knox engineering staff is recognized as an authority on the subject of dust collection. Experience with every kind of dust problem enables them to plan an economical and thorough installation.

POWER SAVING—
Less back pressure means more power efficiency with corresponding dollars and cents economy.

TAKES UP LESS SPACE—
Blaw-Knox Dust Collectors have the largest effective cloth area per sq. ft. of space occupied.

FIRESAFE STEEL FRAME—
All-steel bag separation frames mean reduction of fire hazard.

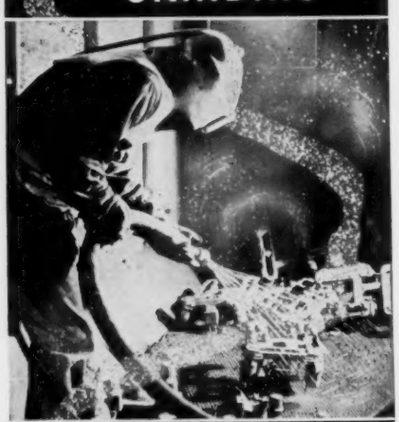
SIMPLICITY—
All parts sturdy and strong. Minimum supplementary equipment (valves, etc.) required.

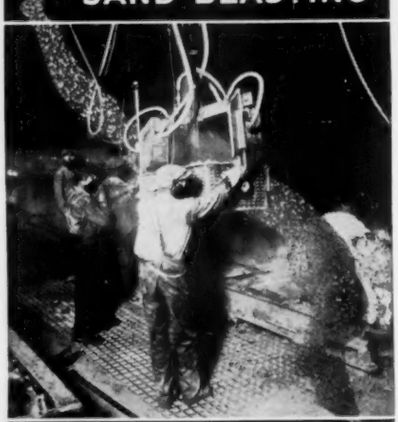
LOW WEIGHT—
Light but strong construction throughout.

ACCESSIBLE—
EASY TO CHANGE BAGS—
Bags are changed in a fraction of the time usually required.

LOW ERECTION COST—
Made to fit. Bags are speedily adjusted and sealed.

GRINDING


SAND BLASTING

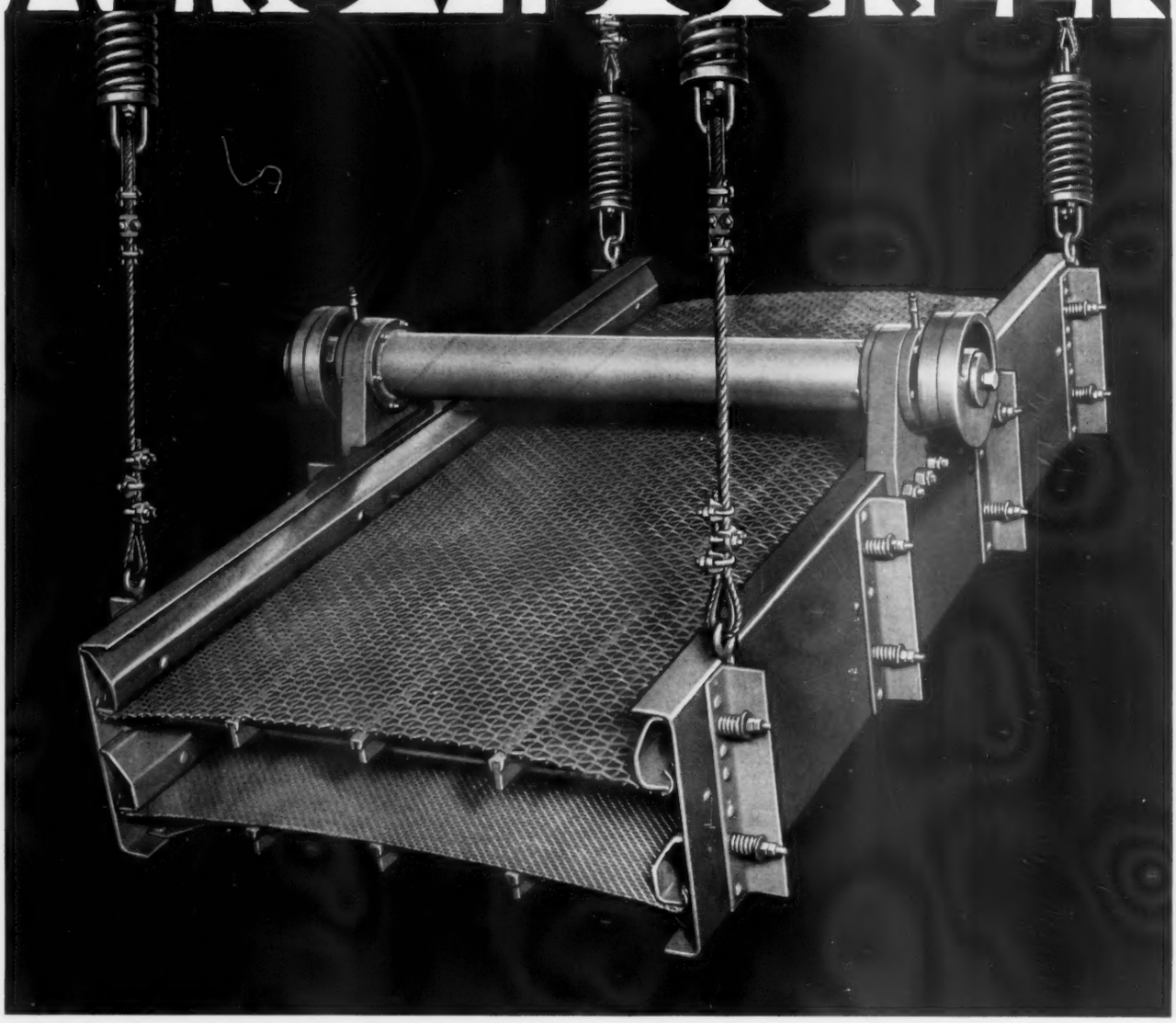

SHAKEOUT FLOOR

BLAW-KNOX

BLAW-KNOX

STEEL FRAMED BAG DUST COLLECTORS

AERO-VIB SCREEN



A Light Weight . . . Rugged . . Low Cost Vibrating Screen

The Aero-Vib screen is suspended by cables and springs, confining all vibration to the body and material on the decks. It has a rapid intense screening action, the amplitude of which is adjustable to fit screening conditions. The screen cloth is held in tension in the body and easily changed. The screen is of simple rugged construction. The vibrating mechanism has only two bearings and is a self-contained unit located conveniently above the body. Aero-Vib screens are supplied with Texrope drives and totally enclosed, dust and moisture proof, anti-friction bearing motors. *Bulletin 1474.*

ALLIS-CHALMERS

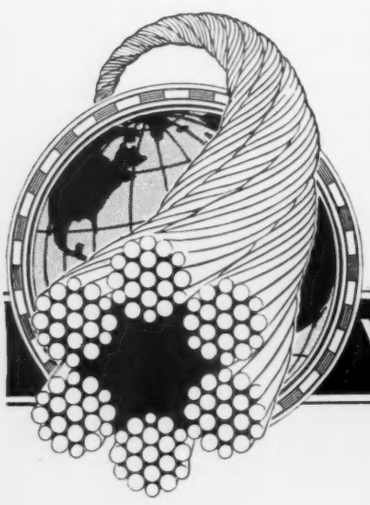
Allis-Chalmers Manufacturing Company, Milwaukee

Williamsport
wire rope is more DEPENDABLE·

There's nothing more exasperating to a user than to have ropes which move a variable number of yards of material. To have an equipment go out of service until a new rope is installed is expensive and unpleasant.

Williamsport's system of manufacture and testing, we believe, is exceptionally uniform in productive results. This is learned through an exhaustive check by our engineering department.

Operators tell us that they can figure out mighty accurately what a Williamsport wire rope will do on a job. And doesn't that help you when you FIGURE a job? We think so. Try a Williamsport on your next replacement and get a pleasant surprise.



WILLIAMSPORT WIRE ROPE CO.

Main Office and Works:
WILLIAMSPORT
PENNA.

General Sales Offices:
122 So. Michigan Ave.
CHICAGO

In 60 Days
Raymond Equipment
was specified for these widely varied uses

California	*	Mechanical Air Separator for classifying a COPPER POWDER.
Connecticut	*	Mechanical Air Separator for making a PARTING COMPOUND.
Georgia	*	Imp Kiln Mill, Automatic Pulverizer and three Mechanical Air Separators for PAPER CLAY.
Illinois	* *	Screen Pulverizer for grinding DRIED WHEY.
Illinois	* *	Imp Pulverizer and Mechanical Air Separator for SOYA BEANS.
Illinois	* *	Four Imp Mills for SEWAGE DISPOSAL.
Massachusetts		Screen Pulverizer for making COCOA POWDER.
Massachusetts		Two Screen Pulverizers for grinding SUGAR.
Missouri	*	Mechanical Air Separator for CHEMICALS.
New Jersey	*	Mechanical Air Separator for classifying a special POWDERED MATERIAL.
New Jersey	*	Screen Pulverizer and Mechanical Air Separator for processing DRY COLORS.
New Jersey	*	Screen Pulverizer for grinding COCOANUT RESIDUE.
New York	*	Automatic Pulverizer for reducing GUM RESIN.
New York	*	Screen Pulverizer for grinding DRIED WHEY.
New York	*	Screen Pulverizer for grinding DRY COLORS.
Ohio	* *	Screen Pulverizer and Mechanical Air Separator for BETA NAPHTHOL.
Ohio	* *	Two Automatic Pulverizers for grinding PIGMENTS.
Texas	* *	Screen Pulverizer for grinding DRIED WHEY.
China	* *	Roller Mill for LIMESTONE and Mechanical Air Separator for processing a SPECIAL PRODUCT.
Uruguay	*	Roller Mill for grinding SULPHUR.

This is a typical cross-section of Raymond service during a recent 60-day period, showing the ability of Raymond equipment to handle a wide diversity of problems in the manufacture of powdered materials.

With a background of 46 years of continuous service to the pulverizing industry, Raymond engineers are qualified to study your problem and work out an efficient installation for your plant.

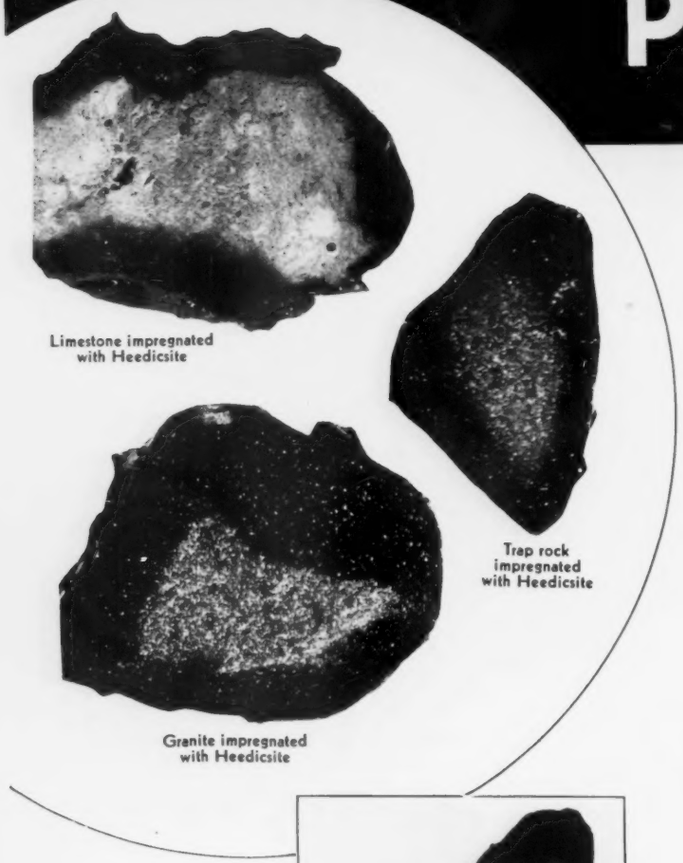
Your inquiries are invited on operations that involve grinding, drying, separating or dust collecting.

ORIGINATORS OF AIR SEPARATION
PIONEERS OF PULVERIZING
SINCE 1887

RAYMOND BROS. IMPACT PULVERIZER CO.

Main Office and Works:
1321 North Branch Street, Chicago
Eastern Office: 200 Madison Avenue, New York
Western Office: San Fernando Building, Los Angeles

A NEW opportunity to increase your PROFITS



Limestone impregnated with Heedicsite

Trap rock impregnated with Heedicsite

Granite impregnated with Heedicsite

When mineral aggregate impregnated with asphalt by the Heedicsite method is viewed through the enlarging glass the deep even penetration is distinctly seen

Much of the present material used in road building is bituminous-mixed mineral aggregate. Using the Heedicsite method you can make an improved bituminous paving mixture at a lower cost than is possible by any other method.

Heedicsite-made material not only meets state specifications but is so superior that highway engineers who have examined it have given their enthusiastic approval. The product is permanently free from water, the penetration is greater, and the bond more homogenous.

Because of the simplicity of the process, the plant costs less than ordinary plants. The system used is automatic, requires the minimum of attention, and is as free as possible from human error.

Write for details regarding the Heedicsite method and the unusual franchise offered.

THE HEEDICSITE CO.
GRAND RAPIDS, MICHIGAN

THE HEEDICSITE *METHOD*

of impregnating mineral aggregate with asphalt

War Ruins the Business Man
Can It Be Abolished?
Yes, but only through Organized Effort for Peace

SOME short-sighted business men imagine that war is profitable. What blindness! You make money for a year or two. Later you lose it, together with your original capital. Does any sane man doubt that today's Depression is largely caused by the World War? The war created an exaggerated nationalism, tariffs, import quotas and a complex machinery designed to block the free course of trade.

War's Tax Burden

The tax burden of war, actual or potential war, is overwhelming. About 75 per cent of every federal tax dollar goes for war and war pensions. Isn't it clear that War—a completely destructive force—must in the long run be paid for by everyone?

War must be eradicated: like duelling — like small-pox — like any barbarous relic of the past. *If we don't crush war—war will crush us.* Every sane man wants Peace. What father wants his son bayonetted — gassed — blinded? But how to get Peace? Peace must be fought for. Only steady, unremitting effort can achieve it. *We must wage Peace.*

World Peaceways believes in using the tremendous force of advertising to create Peace sentiment: using it in every country. Diplomacy has failed too often. Diplomacy backed by public opinion can stamp out this curse. World Peaceways is behind Bruce Barton's project of a government fund for advertising the necessity for Peace. You should read his challenging article "Let's Advertise this Hell!"

We are focused on this job. We are purposeful — practical. We know how to gear into the nation's commercial life and secure propaganda at slight cost. Through making it clear to business that *Peace Pays* we secured gratis from the Outdoor Advertising Association $40,000 worth of space for our giant posters. We are publishing advertising in magazines with a circulation of millions. Any sane man or sane group is glad to cooperate with us. American business men have seen what advertising and propaganda can do in moulding public opinion in other aspects. They realize that they can do as much in the field of Peace. We are beginning our work nationally: we intend promptly to expand into the international field. The last great war cost 333 billions. An advertising expenditure of but a fraction of that can prevent the next war. Too long has the Peace problem been left to politicians and impractical idealists.

Let Business Men Tackle It
Let Advertising
Achieve Peace

We appeal to every forward-looking business man to lend a hand. Send us your contribution—little or much—whatever you can spare, in stamps, check, money-order or registered mail. It is an investment —not an expenditure.

Act Today

Remember, we are a business group, manned by business men. We speak your language. If you want more information about us —write for it. Our records are wide open.

Our Board Members and Endorsers Include:

Bruce Barton
Stanley High
Herbert S. Houston
Mary E. Woolley
Walter Dill Scott
Bennett Chapple
Prof. Franz Boas
Theresa Mayer Durlach
Prof. Benj. R. Andrews
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Ray Newton
E. Raymond Wilson
Etc., etc.

WORLD PEACEWAYS
HOTEL ROOSEVELT
New York City

WORLD PEACEWAYS
Hotel Roosevelt New York City

Here is my contribution. I am showing your appeal to friends with the hope that they, too, will respond.

Name .....

Address .....

City .....

State .....

P. & Q. 11-33

Announcing ....

Jeffrey Acquires Traylor Principle of Controlled Vibration

as Applied to . . . .

Feeders — Conveyors
Coolers — Dryers
Screens — Barrel Packers
Foundry Knock Outs

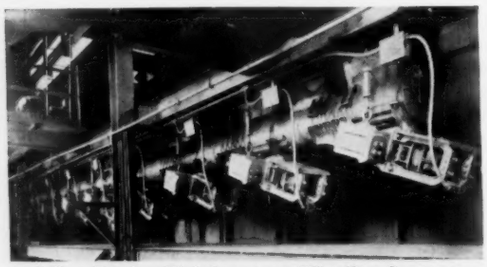
We are pleased to announce the acquisition of the entire manufacturing and selling rights for all devices heretofore manufactured and sold by the Traylor Vibrator Company of Denver, Colorado.

Traylor Conveyors, Feeders, Screens, Dryers and Coolers added to the Jeffrey line, round out a complete service for every material handling requirement.

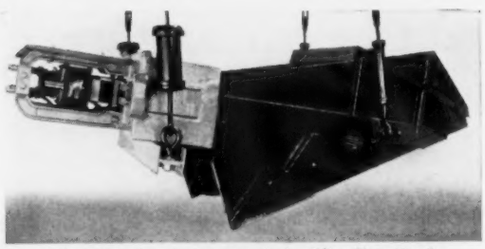
Hereafter the business will be conducted as the Jeffrey-Traylor Division of The Jeffrey Manufacturing Company in Columbus, Ohio, where both mechanical and electrical parts of the Jeffrey-Traylor units will be built.

Inquiries and orders should be addressed to Columbus or your nearest Jeffrey or Traylor dealer.

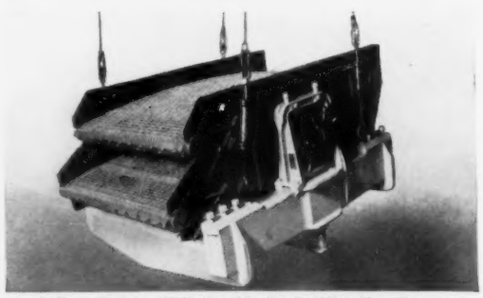
All products covered by Patents and Patents Pending



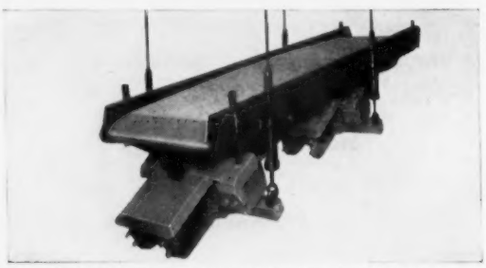
Jeffrey-Traylor High-frequency Vibrating Conveyor



Jeffrey-Traylor Conveyangrizzly Vibrating Feeder



Jeffrey-Traylor F B Double Deck Vibrating Screen



Jeffrey-Traylor Hot Air Vibrating Screen Dryer

The Jeffrey Manufacturing Company
917-99 North Fourth St. Columbus, Ohio

New York	Boston	Chicago	Denver
Buffalo	Scranton, Penn.	Huntington, W. Va.	Salt Lake City
Rochester, N. Y.	Cincinnati	Milwaukee	Birmingham
Philadelphia	Detroit	St. Louis	Dallas
Pittsburgh			

Jeffrey Manufacturing Company, Ltd., of Canada
Head Office and Works, Montreal
Branch Offices, Toronto—Calgary—Vancouver

JEFFREY
MATERIAL HANDLING EQUIPMENT

NRA MEMBER U.S.
WE DO OUR PART

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VOLUME 26 MAY -9 1934 NUMBER 5

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, NOVEMBER, 1933

Portable-Plant Owners Object to Code Rules

DELAYS N.R.A. ACCEPTANCE

The failure of the National Recovery Administration to date to take any action on the proposed code of fair competition of the sand and gravel, crushed stone and slag industries has caused a good deal of impatience among producers. This code was one of the first submitted and under ordinary conditions such as prevail in some other industries might have been approved long ago. Obstacles have arisen, however, which will have to be overcome before approval can be secured. The committee appointed by the producers is proceeding on the basis that it is more important to get an effective code than to get one quickly. V. P. Ahearn, executive secretary of the National Sand & Gravel Assn., on Oct. 21 made the statement that the delays experienced with this code are not exceptional as, of 1,340 codes submitted to the Administration up to that date, fewer than 50 had been approved by the President and about 75 per cent. of the codes had not even progressed to the stage of an informal conference.

The Committee on Organization of these industries met in Washington on Oct. 6 for a conference, at which representatives of contractor-producers were present. They objected that Article V of the mineral-aggregates code prejudiced their considerable investment in portable-plant equipment and that this article together with other features of the code would put them out of business. It was claimed that contractor-producers in 1932 produced 52,500,000 tons of sand, gravel and crushed stone, contrasted with a production by stationary plants of 175,000,000 tons in the same year.

Changes requested in this code were: Elimination of control over production, even in Metropolitan areas; revision of Article II to provide for an equal division on regional and district committees between stationary and portable producers; elimination of the provisions of Art. IV with reference to average cost determination below which no material could be sold; revision of Art. III in order to compel stationary plants to work the same hours and pay the same wages which contractor-producers are forced to observe by the N. R. A.: 30 hr. per week with a minimum wage of about 50 c. for unskilled labor and $1.10 to $1.20 for skilled labor.

The Committee on Organization would not abandon its position that production control was necessary in effecting a stabilization of the mineral industries. At its last conference with the Administration on the evening of Oct. 10 the committee submitted what it described as its final revision of the code. At that time the contractor-producers voiced the objections outlined above and Deputy Administrator Pirnie, with the support of the economic advisor, stated that it would be unwise for the Administration to set up cost-control provisions in the code, or in any other code, which might have the tendency of raising the price of materials to a level which would destroy any hope of a revival of building next year.

It is claimed that insistence upon the inclusion of the contractor-producer in the code will result in exposing the established plants to an impossible wage scale and an equally impossible work-week; that it will inevitably result in the weakening of Article IV; that it will disrupt the administrative features of the code; and that the eventual result of Article V would be to drive states and subdivisions of government into the sand-and-gravel and stone business. Despite these considerations, the code must establish the principle that control over production, equitable and fair to all, is a necessary corollary in placing the industry on a sound basis of activity.

California Gravel Plant Installs New Machinery

★ The plant of the Atlas Rock Co. at Oakdale, Cal., was recently completely overhauled and new machinery installed. In addition to sand, gravel and crushed gravel, the plant also produces Atrock, a highway material.

★ The Madison County Limestone Co., recently formed, has opened a new limestone quarry near Winterset, Ia. Most of the stone is being used in Des Moines and vicinity.

Canada Cement Output Less Than Half of 1931

SELLING PRICE ALSO LOWER

Statistics just issued covering operations in the Canadian cement industry in 1932 show that shipments from plants in the Dominion amounted to 4,498,721 bbl., having a value of $6,930,721 as compared with 10,161,658 bbl. valued at $15,826,243 in 1931.

Cement was produced in five of the provinces during the year under review, the province of Quebec accounting for 49.1 per cent. of the total, with Ontario next at 35.6 per cent., Manitoba 5.4 per cent., Alberta 4.3 per cent., and British Columbia 5.6 per cent. Selling prices during 1932, f.o.b. Canadian works were as follows: High $2.55 per bbl.; Low $1.25 per bbl.

Imports into Canada were 21,350 bbl., averaging $2.72 per bbl. (estimated at 350 lb. each) as against 38,392 bbl. averaging $3.74 in the previous year. Exports were recorded at 53,333 bbl. in comparison with a total of 114,064 bbls. in the previous year. Cement made available for consumption in Canada amounted to 4,466,738 bbl.

A total of 41 rotary kilns were operated during the year, having a daily capacity of 43,622 bbl. The industry consumed 1,141,376 tons of limestone and 27,537 tons of gypsum. Six plants employed the wet process, five the dry system and one operated with purchased clinker.

The total apparent consumption declined by about 55 per cent., this following very closely the decline in building permits. Some of the plants were operating at about 30 per cent. of their capacity.

Penn-Dixie Cement Plant Extends Aërial Tramway

★ The Pennsylvania-Dixie Cement Corp., Nazareth, Pa., has under construction an addition to the aërial tramway it has used for many years for conveying crushed cement rock from the quarry to the plant. Both the original tramway and the new 5,000-ft. addition were furnished by the American Steel & Wire Co., and the structural steel for the addition by the Lehigh Structural Steel Co.

Diversion of New York Motor Tax Held Illegal

75 PER CENT. DIVERTED IN 1933

A legal-opinion declaring that the gasoline-tax-diversion policy now being followed by the State of New York is a violation of state law has been rendered by George R. Lunn, Jr., attorney at Rochester, N. Y. He stated that "the diversion of highway funds for any purpose other than that provided by statute is illegal." This opinion was rendered at the request of the New York State Construction Council which, with other groups, has constantly protested against the increasing diversion of motor tax funds for other purposes than highway construction. This diversion was begun in 1932 and it is estimated that so far in 1933 about 75 per cent. of the motorists' highway toll money has been diverted.

New Plant in Wyoming Goes Into Operation

★ The Muscovite Mica Mining & Milling Co., Guernsey, Wyo., has installed equipment for the commercial production of scrap and sheet mica in its new plant which went into operation on Oct. 16. This equipment includes an engine, crusher, rolls, screens, etc.

Illinois Gravel Producer to Build Barge Terminal

The Kingston Lake Gravel Co., Mapleton, Ill., has taken a 5-year lease on a 3-acre tract of land on the Illinois River in East Peoria, according to Geo. Childs, president of the company. The property will be used for terminal facilities for sand and gravel brought up the river from the plant by barge for local use. Steel bins will be built for storing the material and will be equipped with scales. Equipment for heating the aggregates will be installed and a branch office erected.

New Texas Silica Plant Is Nearing Completion

★ The Texas Production Co., Tahoka, Tex., has under construction and nearing completion, a plant for the mining and refining of volcanic ash, silica and fullers' earth, according to information from V. S. Cassel, manager of the company.

A.M.S.E. Annual Meeting To Be Held in New York

The American Society of Mechanical Engineers will hold its fifty-fourth annual meeting Dec. 4 to 8 at the Engineering Societies Bldg., 29 W. 39th St., New York City. Among the subjects to be discussed which are of particular interest to the non-metallic mineral producers are *The Maintenance of Materials Handling Equipment*, By J. M. Enders, General Electric Co., and *Survey of Drying Methods.*

Canadian Employment in Steady Monthly Increase

The bureau of statistics of the Dominion of Canada reports that industrial employment on Oct. 1 showed its sixth consecutive monthly increase. The bureau's employment index has risen from 76 on April 10 to 90.4 on Oct. 1, an advance of 18.9 per cent. in six months.

Illinois Town Buys Crusher and Elevator

★ The town of Middlefield, Ill., recently purchased a 12 by 22-in. Reliance portable crusher with folding elevator from the Universal Road Machinery Co., Kingston, N. Y.

Mineral Wool Made from Common Slag

Mineral wool has been manufactured in the United States for more than 50 years and a number of nonmetallic mineral producers are finding the manufacture of this material to be a profitable sideline. It remained, however, for the C. W. Poe Co., 2795 E. 83rd St., Cleveland, O., to utilize common slag for the manufacture of mineral wool.

This company recently completed and placed into operation a modern cupola for blowing mineral wool from slag. Alternate layers of slag, coke and other materials are charged into the cupola and heated to a temperature of nearly 3,000 deg. F. As the molten slag runs out of the bottom of the cupola a stream of high-pressure steam blows the slag into tiny woollike threads. This material is noncombustible and has a high insulating efficiency.

North American Adds Four New Directors

The North American Cement Corp. recently added to its board of directors, Leo M. Blancke, New York, chairman of the debenture bondholders' protective committee; Ridley Watts, New York, chairman of the stockholders' protective committee; W. L. Peltz, Albany; and J. B. Ferguson, Hagerstown, Md.

Michigan Stone Plant to Be Reopened by Lessee

The plant and property of the defunct United Stone Co., at Bellevue, Mich., have been leased to Ernest Pastor of Bellevue and Julius Kenedy and Martin Hoffman of Detroit. Plans are to resume operations shortly.

Santa Cruz at Work on $1,000,000 Program

CONVERT BOAT FOR UNLOADING

The project of the Santa Cruz Portland Cement Co., Santa Cruz, Calif., for the expenditure of over $1,000,000 to make possible water shipments, which was announced in the October issue of PIT AND QUARRY, is already under way. Concrete foundations have already been poured for the silos at the plant and materials are being received for the construction of the pier. Property at Stockton has been purchased and the construction of a distributing plant there will be started before the end of the year. A 400-ft. freighter, the "Pacific Cedar," has been purchased from the U. S. Shipping Board and will be rebuilt into a self-unloading bulk-cement carrier at an estimated cost of about $500,000, according to reports.

Marquette Takes Bankers Through Oglesby Plant

The Marquette Cement Mfg. Co., Chicago, Ill., on Oct. 13 was host to 300 members of the American Institute of Banking. The guests were taken on a tour of the company's plant at Oglesby, Ill. They were taken to LaSalle by bus from Chicago and served a luncheon. Then by special train they went to Oglesby and made an intensive trip through the plant. Richard Moyle, vice-president of operations, and other employees of the company acted as guides.

Kentucky Cement Plant Makes Several Purchases

★ The Kosmos Portland Cement Co., Kosmosdale, Ky., recently replaced its locomotive haulage system in the quarry with three new Mack trucks equipped with Easton bodies. A Turbo-Clone dust collector is being installed in the plant.

Sentenced for Stealing Gravel Plant Equipment

Two men were sentenced to terms of 1 to 5 years in prison recently and several others are awaiting sentence for the larceny of a locomotive, tracks and other equipment from the Hersey Gravel Co., Hersey, Mich.

The Durable Rock Asphalt Co., Inc., Leitchfield, Ky., which was recently organized, has purchased the plant and deposit of the Crown Rock Co. near Big Clifty, Ky.

★ The Latta Brook Sand & Gravel Co., Elmira, N. Y., has installed a Niagara 24-in. by 6-ft. gyrating tube scrubber.

Construction Contracts Show Large Increase

SEPTEMBER 16% ABOVE AUGUST

September construction contracts amounted to $122,615,700, a gain of almost 16 per cent over the August, 1933 total of $106,131,100 and but slightly below the September, 1932 total of $127,526,700 according to F. W. Dodge Corporation. This is the first month in which the 1933 total practically equalled the corresponding month of 1932. The cumulative total for the first nine months of 1933 amounted to $743,553,300 as compared with $1,057,363,200 for the corresponding period of 1932.

The largest gain in the September contract record over August occurred in public works with a month's total of $57,323,800 as compared with $32,002,500 for August. This increase was due largely to additional contracts for highway construction and levee work in the Mississippi valley. These gains occurred chiefly in the Pittsburgh, Southeast, Central Northwest, Southern Michigan, St. Louis, Kansas City and New Orleans Territories.

Non-residential building for the month amounted to $37,977,300 as compared with $32,796,600 for August and $35,997,400 for September of last year. New hospitals, distillery projects; chemical plants and some new public buildings contributed largely to this increase which occurred in the following territories: Metropolitan New York, Southeast, Chicago, New Orleans and Texas.

Residential building started during September amounted to $23,889,300 as compared with $21,937,000 for August and $22,803,900 for September, 1932. Two large dormitory units in the New England and Chicago Territories contributed to this increase.

Public utilities for the month totaled $3,425,300 as compared with $19,395,000 for August and $4,522,700 for September, 1932. The unusually high total for August was due to several individually large contracts for water supply systems.

The significant development in the September record of construction contracts awarded was the large gains in publicly-financed projects. It will be recalled that the first evidences of improvement at the beginning of the second quarter of this year occurred in the privately-financed projects. This gain which was fairly consistent and general both in residential and non-residential building was followed by a marked increase last month in publicly-financed construction. Most of the gains during September occurred in this type of construction while privately-financed construction continued to hold the levels previously attained.

Of further significance was the total of new construction projects contemplated. Since last March there has been a continued and rapid increase in new work planned. The September total amounting to $846,726,700 represented the largest monthly total since April, 1930. This is a most favorable augury pointing toward continued construction improvement. The territories in which the largest gains occurred included the Southeastern States, Chicago Territory, Southern Michigan, St. Louis Territory, Kansas City Territory, New Orleans Territory and Texas.

Illinois Plant Profits by Legalization of Beer

★ The Olive Branch Mineral Products Co., Olive Branch, Ill., producer of silica, flint and clay, recently went into operation, having been reorganized since its bankruptcy in 1932. W. C. McCarty, the new owner, bought the deposits from which the raw material is obtained and further decreased operating costs by installing a generating plant. The return of beer has made it necessary to run the plant night and day to keep up with the demand for silica and for a flint powder used for cleaning bar fixtures.

Florida Lime Hydrating Plant Destroyed by Fire

The main portion of the hydrating plant of the Dixie Lime Products Co., Ocala, Fla., was destroyed by fire on Oct. 8 with an estimated loss of about $30,000.00. W. M. Palmer, president of the company, announces that the plant will be immediately rebuilt.

Waterproof Cement Announced by Aetna

In addition to its regular gray and waterproofed gray Portland cements, the Aetna Portland Cement Co., of Detroit, Mich., has recently placed on the market a waterproofed masons' mortar cement. This product is the result of several years of research in the company laboratories. In addition to high compressive strength, extraordinary plasticity and workability are features claimed for this new product. O. A. Dibble is general superintendent, and Paul Bischoff is chief chemist.

New York Stone Producer Building Plant Addition

The Binghamton Crushed Stone & Gravel Corp., Binghamton, N. Y., has begun the construction of a $15,000.00 addition to its plant in that city, according to officers of the company. This new unit will be used for crushing material for highway construction and modern crushing equipment is to be installed.

★ The Worlock Stone Co., Canastota, N. Y., has installed a Niagara 24-in. by 6-ft. gyrating tube scrubber.

Michigan State Cement Plant Sold for $30,000

NEW OWNER TO MAKE FERTILIZER

Governors of various states who have been talking loudly of building state cement plants because of justified increases in the price of cement might profit by the example of the state of Michigan, which has probably had more experience with state-operated plants than any other.

The Michigan State cement plant at Chelsea, Mich., seems at last to be finally disposed of after many years of bickering and uncertainty. The purchasing committee of the state administrative board has passed a resolution recommending that the offer of Joseph E. Zilk, Ann Arbor, Mich., be accepted. It is said that the board almost invariably follows the recommendations of its committee. The sale price of the plant was $30,000.00, in comparison to its initial cost to the state of about $500,000.00, and the operating deficit since that time of another half million. Mr. Zilk says the plant will be used for the manufacture of fertilizer.

New Jersey Gravel Plant Sold to New Corporation

The receivers of the North Sand & Gravel Co., Carpentersville, N. J., have sold the plant to the Warren Sand & Stone Co., a new corporation formed by former owners of the quarry who also have a sand and gravel plant at Netcong, N. J. The officers of the new company are: John Gallo, president; Wm. A. Stotz, vice president; Michael Gallo, treasurer; K. F. Kressler, secretary.

★ Thatcher Bros., Toledo, O., dredging contractors and sand and gravel producers, recently rebuilt their hydraulic dredge and replaced an old 8-in. dredge pump with a new Morris 10-in. manganese-steel heavy-duty pump.

Kansas City Limestone Mine Now a Roadhouse

Abandoned pits, quarries and mines have been put to many practical uses but perhaps the most unusual was the recent conversion of a limestone mine near Kansas City, Mo., into a dine and dance establishment. The rooms in the mine were left in their natural state and the tunnel entrances fitted with air-tight doors. Air circulation is obtained through ventilator fans in the air shafts of the mine, giving an even year-round temperature of about 70 deg. F.

★ The Aetna Portland Cement Co., Bay City, Mich., recently began the construction of a new wholesale warehouse at the foot of Throop St., Saginaw, Mich.

Lime Maker Enjoined Against Cheap Selling

FIRST DEFENDANT UNDER CODE

U. S. Judge Claude M. McCallum, at Dallas, Texas, on Oct. 16 granted a temporary injunction to John Michel, a Dallas lime manufacturer, to prevent the city of Dallas from purchasing lime at $8.35 per ton from the Dittlinger Lime Co., New Braunfels, Tex. A hearing was held Oct. 28 to determine whether the city of Dallas should be permanently enjoined from buying its lime from that company.

Mr. Michel claims that the price of $8.35 per ton which the city accepted in the bid on Oct. 12 was below the cost of production and in violation of the lime industry code. According to the petition the Dittlinger company would have to pay $4.20 per ton to ship the lime to Dallas and would receive only $3.98 per ton after allowance of a 2 per cent. discount for cash. The bid submitted by Mr. Michel was $10.75 per ton for lime manufactured near Dallas, a figure which he claims is in line with code provisions and allows a reasonable profit.

Slate Industry Code Is Scheduled for Hearing

The slate industry, represented by the Nat'l. Slate Ass'n., which claims to represent 80 per cent. of the industry, has submitted its proposed code. A public hearing on this code will be held beginning at 10 A.M. Thurs., Nov. 9, 1933, in the Caucus Room, New House Office Bldg., Washington, and will be conducted by Malcolm Pirnie, deputy administrator.

Columbia Silica Profits Through Return of Beer

The Columbia Silica Co., Copley, O., along with many other producers of silica sand, has experienced a material increase in business due to the demand for beer bottles created by the legalization of beer.

Alpha Begins Extensive Changes at Cementon

According to a recent report the plant of the Alpha Portland Cement Co., Cementon, N. Y., has suspended production and is going ahead with an extensive improvement program which was announced in these pages some time ago. The raw-grinding department is being replaced with an entirely new building and machinery, the kiln room is being remodeled, two old kilns are being removed and three others are being remodeled and reset. Clinker coolers are being attached to each kiln and a new steam turbine generator is being installed. The property is also being landscaped and otherwise improved.

As the plant is operating under the NRA the men employed in making these improvements are working on a 36-hr. week. More men are now employed than when the plant is in operation and they will be kept busy until late in March, when these improvements are expected to be completed.

Jap Cement Dumping in Honolulu Protested

American contractors in Honolulu have sent a protest to Washington against the use of Japanese cement in the construction work being done at Fort Ruger, a United States army base. Regulations against cement dumping are asked.

Gold Discovered in Indiana Gravel Pit

Gold has been found in the deposits of the Potter Bros. gravel plant near Gosport, Ind., in sufficient quantities to pay for the installation of equipment for recovering it. According to Claud Waln who made the tests, the gold runs about 70 c. per cu. yd. of gravel.

New Mexico Potash Plant Is in Partial Operation

The United States Potash Co., Artesia, N. M., is now shipping about 1,000 tons of potash daily to the eastern and southeastern seaboard for fertilizer manufacture. Two shafts about 1,050 ft. deep have been sunk, but only one is in full use pending the completion of a ventilating system in the other.

St. Louis Producer Opens Rip Rap Quarry

The Columbia Quarry Co., St. Louis, Mo., recently opened its quarry near Chester, Ill., which it purchased about a year ago and which has been idle since that time. The site is now being stripped and overburden cleared away. A contract for 35,000 yards of riprap for government work on the Mississippi River is responsible.

The Casper Stolle Quarry & Contracting Co., has moved its office from the First National Bank Bldg., East St. Louis, Ill., to its main plant at Stolle, Ill. The new mail address is Box 301 R. R. No. 1, East St. Louis, Ill.

★ The firm of Brown and Root is reported to be going ahead rapidly with the development of a new asphalt property near Cline, Tex.

Phosphate Producers in Agreement Over Exports

It is reported that an Anglo-French phosphate agreement, which leaves each party free to sell anywhere in Europe but limits American sales to a certain percentage based on each company's consumption, has been reached.

It is also reported that North African phosphate producers have reached an agreement with American producers governing exports. The agreement is said to have averted a price war which was threatened because of the advantage given to the American producers by the depreciation of the dollar.

New Michigan Talc Mine and Plant in Operation

★ The Michigan Talc Mining Co., 2970 W. Grand Boulevard, Detroit, Mich., which was incorporated some time ago with a capital of $150,000, has opened a talc deposit near Ishpeming, Mich. A shaft was sunk to a depth of 100 ft. and a drift carried into the vein. The raw material is hauled by truck to railroad and shipped either direct to users or to the company's mill in Detroit.

Monument Firm's Code Shortest Yet Submitted

The shortest code yet submitted to the NRA was received on Oct. 26. It was written on a postal card in long hand and came from the Oakland Monument Co., 1704 College St., Little Rock, Ark. It was accompanied by the request to "please write us accepting the following code."

It reads "Shop open 52 hr. per week "All employees work 40 hr. per week. "Pay as follows: Skilled mechanics 50 c. per hr.; Mechanics 35 c. per hr.; Skilled labor 25 c. per hr."

According to a telegraph company's count this code contained 36 words. It was signed by the Oakland Monument Co. and is under consideration by the NRA.

Gypsum Producer Opens New Canadian Deposit

The Atlantic Gypsum Products Co., Boston, Mass., has opened a new deposit of high-grade gypsum at Aspy Bay, Dingwall, Cape, Breton, Nova Scotia, which has been under development for some time. A dock built by the Canadian government is being used for shipments. This dock is part of a breakwater, channel and harbor development recently completed.

The Iowa Geological Survey announces that its office has been transferred from the State House at Des Moines, Ia., to the Geology Bldg., State University, Iowa City, Ia.

National Industrial Recovery

Figures Show Success of Recovery Program

EMPLOYMENT GAINS ON OUTPUT

That the Roosevelt industrial-recovery program has been far more successful fundamentally than is generally believed is evident from monthly statistics compiled along lines laid out by former President Hoover and which are generally considered to be an accurate and foolproof business barometer. The following table uses the average of the years 1923 to 1925 as a base of 100 and the figures are adjusted for normal seasonal variations.

Month	Factory Industrial Production	Employment	Freight Loadings	Department Store Sales	Exports	Imports	Pay-rolls
Dec. '31.	74	69.4	69	81	46	48	55.8
Jan. '32.	72	68.1	64	78	39	42	52.4
July	58	58.3	51	67	32	27	39.6
Sept. ...	66	60.3	54	70	33	32	42.1
Dec.	66	60.6	58	62	32	30	40.9
Jan. '33.	65	59.4	56	60	31	29	39.2
Feb.	64	59.4	54	60	29	26	40
March ..	60	56.6	50	67	28	26	36.9
April ...	67	57.7	53	67	29	25	38.6
May	77	60.6	56	67	32	32	42
June	91	64.8	60	68	36	40	46.2
July 100		70.1	65	71	43	48	49.3
August ..	91	73.3	61	77	38	50	55.7
Sept. ...	84	74.3	60	69	40	48	57.6
Oct.(est.)	80	75.0	59	66	..	..	....

It will be noticed that while industrial production has dropped from 100 in July to about 80 for October, employment has increased from 70.1 to 75.0 in October. The fact that production and employment are nearing an even keel is encouraging and is expected by recovery officials to make possible steady progress to normal business conditions. Pay-rolls are still lagging about 20 per cent. behind, but improvement is evident and is expected to continue.

Announce Public Hearing of Soft Lime-Rock Code

The National Recovery Administration on Oct. 24 gave notice that a public hearing of the code of the soft lime-rock industry would be held on Thursday, Nov. 2, in the Willard Hotel, Washington, D. C. This code was filed by the Southeastern Soft Lime-Rock Assn., which claims to represent 95 per cent. of the industry. Deputy Administrator Malcolm Pirnie will conduct the hearing.

The U. S. Bureau of Public Roads recently decided temporarily to abandon all regulations which might retard the road-building program. Plans are to start at least $100,000,000 of secondary road work before Jan. 1.

Schedule Hearing for Talc and Soapstone Code

The talc and soapstone industry, represented by the National Assn. of Talc and Soapstone Producers, which claims to represent 83 per cent. of the industry, has submitted a proposed basic code of fair competition, copies of which are available at the offices of the NRA, Room 3316, Dept. of Commerce, Washington. A public hearing on this proposed code will be held in the Palm Room, Willard Hotel, Washington, D. C., beginning at 10 A.M., Tuesday, Nov. 21, 1933, by the Administrator.

Federal Contracts Stay at $15,000,000 Mark

"Levee and other river work amounting to $12,000,000 maintained the federal contract total for the week ended Oct. 26 at the $15,000,000 mark, while highway lettings, the heavy item in contract awards the last few weeks, slumped to less than a third of the previous week's total, pulling the total of all contracts down to 60 per cent. of the high total of the previous week," says *Engineering News-Record.* "State and municipal contracts, other than highways, were small. Private construction followed road work in the downward trend this week, aggregating less than half of the previous week's total. Many large projects, both public and private, appearing in the lists of proposed work indicate that contract-award figures should continue at a high level for some time to come provided these works are advanced to the contract stage. Large jobs awarded last week include: four hurricane gates for canal openings into Lake Okeechobee, $1,100,000; dredging and levees, Lake Okeechobee, $1,900,000 levees, lower Mississippi basin, $3,200,000; dredging Toledo harbor, $2,900,000, and a distillery warehouse, Peoria, Ill., $1,000,000."

CONTRACTS

(thousands of dollars)

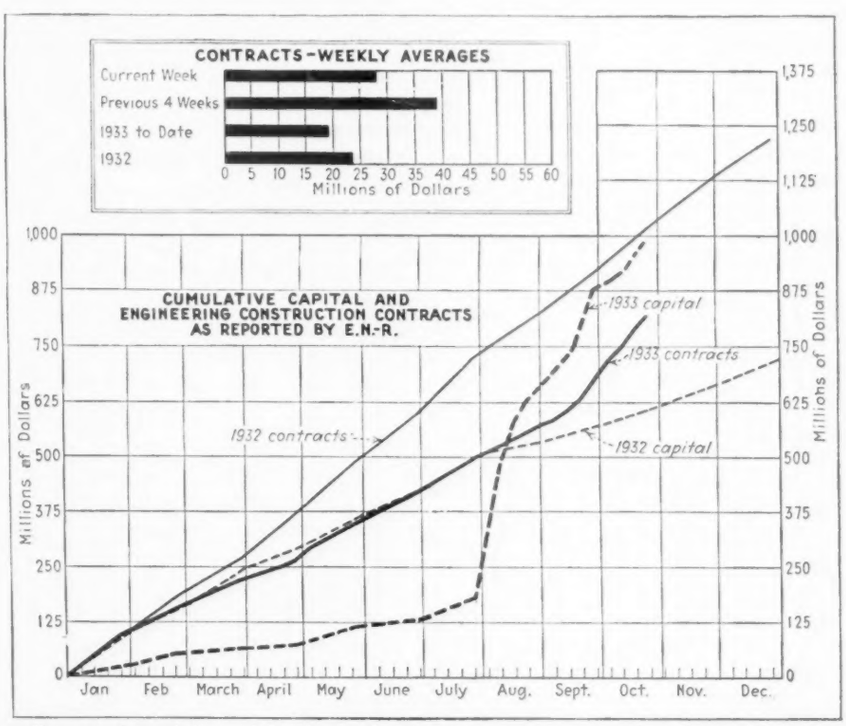
	Weekly Oct., 1932	Average Prev. 4 Weeks	Week Oct. 26, 1933
Federal government	$ 6,263	$13,707	$15,116
State and municipal	13,700	16,214	8,521
Total public	$19,963	$29,921	$23,637
Total private	5,249	8,906	3,884
Week's total	$25,203	$38,827	$27,521
Cumulative to date:			
1932	$1,015,506	1933	$818,360

NEW PRODUCTIVE CAPITAL

(thousands of dollars)

	Week Oct. 26, 1933	Cumulative, 1933
State and municipal	$ 4,970	$238,921
P.W.A. allotments, public	12,074	653,693
Corporate issues	2,200	48,547
P.W.A. allotments, private	....	46,573
Total new capital	$19,244	$987,734
Cumulative, 1932		$613,000

NOTE: These figures include private bonds and stock sold for productive purposes; state and municipal bonds for construction; R.F.C. advances for self-liquidating loans; P.W.A. loans and grants to states and municipalities, including the special highway funds; and P.W.A. private loans.



Progress of cumulative capital and engeering-construction contracts. (Engineering News-Record.)

Editorial

Faith in Regulation by Code

MANY of those who have been most active and outspoken in their opposition to the government's plan of industrial control through codes of fair competition have feared, not so much the principles which underlie the idea, as what seemed to them almost a certainty that unscrupulous business men would attempt to utilize the powers and privileges given them by such codes for the oppression of their competitors. And, unfortunately for those who took a more optimistic view of the outcome, many of the codes submitted by various industries contained provisions which were, sometimes openly and perhaps more often subtly, calculated to place in the hands of certain types of business the power to harass and in some cases even to destroy those who were in competition with them. In such circumstances it has been difficult to make out a good case for the theory of governmental regulation, which, in principle, was to be resorted to in these times as a means for preventing the very things which some of the codes submitted have seemingly been designed to accomplish.

One may take it for granted that no industry has been without examples of the efforts of those who sought to obtain some unfair and even illegal advantage over others, and probably not many of the hundreds of codes of "fair" competition offered for government approval have been wholly free from clear-cut evidence of a desire to legalize actions and tendencies which have been all too common in our commercial life. These attempts have seemed to justify the suspicion that code-writers in general have tried to make the National Industrial Recovery Act an instrument of advantage.

Those who are vitally concerned in the future of the nonmetallic-mineral industries, and who are sincerely trying to make that future more secure by making it more free from the practices that have contributed to its present state, have experienced a growing mistrust of some of the code provisions offered to the government by members of those industries. If that mistrust has not been destroyed by the exchange of opinions regarding it, this may be due to the fact that assurances of altruistic intent were not as convincing as they might have been and that they were considerably weakened by what transpired in the meantime.

Recently an official of a certain producers' organization addressed a letter of warning to a man who contemplated the opening of a stone quarry. He was cautioned against proceeding with his plans and was told that the regional committee that would be appointed under the mineral-aggregates code would take "such steps as may be necessary" to prevent his doing so. Article VI of the code as revised at the Chicago meeting in July was quoted and its last sentence, which read as follows, was underscored: "In the event that it may become necessary to do so,"—that is, to refuse to permit increasing the capacity of any existing plant, or the establishment of a new plant, or the movement of an existing plant from one producing site to another—"the regional committee shall take such steps as may be necessary to enforce the decision."

The opening paragraph of the letter contains these statements: "We are, therefore, taking this opportunity of informing you of the code of fair competition drawn at the request of President Roosevelt at a joint meeting of the national associations of the crushed-stone, sand-and-gravel, and slag industries of the United States. This code was formulated in accordance with the requirements of the National Industrial Recovery Act and the code as adopted will be submitted at once to the President of the United States." The letter closes by saying: "We feel that you will appreciate our position in this matter and further feel sure that you are fully desirous of supporting the President of the United States and his National Industrial Recovery Act."

As the code referred to in this letter has not yet been approved by the government, largely because of protests filed with it on account of the article mentioned in it, the writing of the letter might easily be construed as an act of intimidation. Even should the article mentioned be incorporated in the code as approved by the President—and it should be said that, despite numerous changes in its phraseology, this article has not yet been accepted by the National Recovery Administration—the writer of the letter would probably not be cloaked with the authority to issue any such warning notice.

By repeated mention of the President of the United States and the National Industrial Recovery Act the one to whom the letter was addressed was led to believe that the action he contemplated would run counter to the wishes of the President and that he would be guilty of opposing the President and the government of the United States if he were to pursue his planned course of action. His imagination was allowed to conceive what terrible consequences lay in wait for him if the regional committee should be forced to "take such steps as may be necessary to enforce the decision" not to permit him to go on. As a result he abandoned his plan.

The writing of this letter may have serious consequences because it was widely circulated. At a time when it is necessary to the economic recovery of the country to win the confidence of skeptical minds and the active support of those on whose concerted action the success of the President's plans depend, we deem it particularly unfortunate that impatience and an excess of zeal should have led any organization in our industries to take action of this kind. It is unnecessary to condemn it for it carries its own condemnation, but we must deplore the mistaken judgment which deemed such

premature and unauthorized action a proper and an effective way of furthering the President's recovery program. In our opinion this letter has added greatly to the general mistrust of fair-competition codes by the obvious unwillingness of its author to await government sanction before attempting to impose restrictions, the fairness and propriety of which have been seriously questioned and have not yet received the stamp of official approval.

Errors such as this one are symptomatic of the illness of the times. They indicate to some degree the great stress under which business men have been trying to survive the trials of the last few years, but we do not believe that they are a reliable guide to either their spirit or their intentions. In our opinion the great majority of producers in our industries are reasonably content to submit to a measure of self-discipline such as the President's program has set up; in fact, their strivings in the past, as evidenced by the activities of their trade associations, give sufficient proof of their recognition of the evils that had grown up around them to allay any suspicion of a desire on their part to take unfair advantage of one another. It is for this reason that we deplore any action of the type exemplified by this attempt to make the provisions of the code effective before they have been legalized. It gives what we believe is a false and therefore unjust and misleading impression of the attitude of established producers, the great majority of whom, we firmly believe, seek no privilege or advantage for themselves that they are not willing and glad to have shared by their most dangerous competitors.

Machinery and Unemployment

LABOR-SAVING machinery has come in for its share of blame as a factor contributing to the increase of unemployment and its defenders have exhibited various degrees of skill and logic in meeting the arguments that have been offered against the further spread of mechanization in industry. The charge that automatic machines release men from employment and that their use does not provide an equivalent demand for these men's services elsewhere has been the most common, possibly because it has been considered the one least susceptible to successful refutation. The subject has been discussed principally from the academic point of view because of the scarcity of data that can be used as proof.

Hudson B. Hastings, professor of Industrial Administration at Yale University, offered some nonfactual evidence in an address before the recent Annual Conference on Industrial Relations. "Can we ever expect to reëmploy all those now unemployed without a permanent shortening of the working week?" he asked. "Many people look with horror at the increase in the efficiency of plants which has taken place in the last two or three years. It is said that the average plant is to-day 25 per cent. more efficient than it was when the depression started. Many believe that we can never hope to reëmploy our present unemployed without a permanent shortening of the work week because of the machine and the power that goes with it. Must we then, we may ask, not only call a halt on the invention and use of better labor-saving machinery and methods, but also move backward by either giving up the use of some labor-saving machinery or reducing the hours of work to find employment for all?"

In his defense of machinery against the charge that labor pay-rolls and, therefore, purchasing power are reduced by its growing use he attempted to trace the money saving that results from a hypothetical instance of labor-saving machinery application. The economy, he believes, finds its way into expenditure for either labor or services, even when the force of competition is absent and all the saving goes into profit and thus reaches the field of capital investment. He neglected to mention, however, what would become of the unemployed and their purchasing power in the event that all manufacturing plants should become so thoroughly mechanized that each one, as in the case of a New Jersey rayon plant, could be operated by a single man.

He cited the case of the automobile industry as an example of the truth of his contention that "the introduction of labor-saving devices actually increases the number of jobs available in that particular industry within a very short time." "There is no doubt," he said, "that, if the process of manufacturing an automobile were the same as it was in 1910, we would have only a very small fraction of the people engaged in making automobiles that we have to-day. It is because of the economies resulting from the introduction of automatic or semi-automatic machinery, that the employment in that industry has grown by leaps and bounds. However," he added, "that does not mean that the automobile industry has increased the total opportunities for employment in this country. It has not. It simply means that more people have been diverted to that industry than would have been engaged in it had it not been for the introduction of labor-saving devices."

When it comes to presenting facts in support of his view, the professor is not so voluble. He dismisses this aspect of the question with the following statement: "A sufficient answer may, I think, be found in the records of the Census Bureau which show that in 1930 a larger percentage of our people were gainfully employed than ever before on a census date." We can not dispute Census Bureau figures, but we may still be unconvinced of the soundness of his conclusions. The answer to the great question about which so many people become loquacious is not the simple thing that they would like to make it appear. We are still far from understanding the relationship between the growing use of labor-saving machinery and the extent of unemployment. Perhaps we shall learn something of value from the experiments in a return to hand labor, which have been initiated by the government in its public-works activities.

Lime Industry's Code of Fair Competition Gets Approval of President

Provides for 8-Hour Day, 40-Hour Week and Minimum Rates of 30 and 37½ Cents

ON October 3 President Roosevelt approved the Code of Fair Competition of the lime industry. This code was prepared by the National Lime Assn., of which Norman G. Hough is president and general manager, and was submitted to the National Recovery Administration at a public hearing on August 8, as was reported in the September issue of PIT AND QUARRY. The code became effective October 13.

Under the provisions of the code the association's Trade Relations Committee is established as the code authority for the lime industry and it met in Washington the second week of last month to discuss and act upon questions of administering the code.

The code as approved provides for an 8-hr. workday, a 40-hr. work-week with tolerance for peak demands, all time in excess of 8 hr. per day to be paid for at not less than one and one-half times the hourly rate. Minimum wage rates of 30 c. per hr. in the southern area and 37½ c. per hr. in all other territory, with an equitable readjustment of compensation now in excess of these minima, are provided. Clerical and office employees will receive a minimum of $15 per week in cities of over 500,000 population, ranging down to $12 per week in towns under 2,500 population.

The code as originally proposed was published in full in the July issue of PIT AND QUARRY, pages 33 to 36. The changes made in the code, as shown by the approved form, are indicated in what follows, new matter and changes in wording being printed in italics.

CODE OF FAIR COMPETITION FOR THE LIME INDUSTRY

[Old Sec. I, II, III, V and IX omitted.]

To effectuate the policy and purposes of the National Industrial Recovery Act the following provisions are submitted as a Code of Fair Competition for the lime industry; and, upon approval by the President, shall be the standard of fair competition for this Industry.

ARTICLE I

Definitions

Sec. 1. The term "lime industry" means the manufacture for sale of quicklime and such of its allied products as are natural affiliates.

Sec. 2. The term "employee" shall mean any person employed in any phase of the lime industry, in any capacity, in the nature of employee, irrespective of the method of payment of his compensation.

Sec. 3. The term "employer" shall mean anyone for whose benefit such an employee is so engaged.

Sec. 4. The term "manufacturer" shall include any member of the lime industry who shall be subject to this code.

Sec. 5. The term "district," unless the context otherwise requires, shall mean a Lime Industry District established in Schedule "A" of this code.

ARTICLE II

Labor Provisions

Sec. 1. Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection; no employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing or assisting a labor organization of his own choosing; employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President. [Old Sec. VII (1), (2) and (3).]

Sec. 2. Working Hours.—On and after the effective date no employee (except outside salesmen) shall work in excess of 8 hr. in any one day or in excess of 40 hr. in any week; provided, however, that these limitations shall not apply in periods of seasonal peak demand or in the event of lack of storage facilities, or emergencies, but in no event shall the total working hours of any employee, averaged over a 6 months' period, exceed 40 hr. per week. All overtime work in excess of 8 hr. per day shall be paid for at not less than one and one-half times the hourly rate. These maximum hours shall not apply to foremen, superintendents, managers, officials, or others compensated on a regular salary basis *in excess of $35 per week.* [Replaces old Sec. IV, 1.]

Sec. 3. Rates of Wages.—[Replaces old Sec. IV, 2.] *On and after the effective date,* the minimum *rate of wages for employees, excluding accounting, clerical and office employees,* shall not be less than *30c.* per hr. in all territory south of the northern boundary of *Virginia, Tennessee, Arkansas (including the manufacturing section known as Southwestern Missouri), Oklahoma, New Mexico and Arizona, and* in all other territory the minimum wage rate shall be not less than *37½c.* per hour. *There shall be an equitable readjustment of compensation now in excess of the minimum wages herein established.*

On and after the effective date, the minimum rate of wages for accounting, clerical or office employees shall be not less than $15.00 per week in any city of over 500,000, or in the immediate trade area of such city; $14.50 per week in any city of between 250,000 and 500,000 population, or in the immediate trade area of such city; $14.00 per week in any city of between 2,500 and 250,000 population, or in the immediate trade area of such city; and $12.00 per week in towns of less than 2,500 population. Population shall be determined by the 1930 Federal census.

Employees who by reason of old age or physical infirmities are incapable of normal productive effort may be compensated at a rate not less than 80 per cent of the foregoing minimum rates of pay but the number of such employees shall not exceed 5 per cent of the total number of employees from time to time employed.

Sec. 4. Prohibition of Child Labor.—On and after the effective date, employers shall not employ any person under the age of 16 yr.

ARTICLE III

Marketing

Sec. 1. Uniform Cost-Accounting.—The Trade Relations Committee (hereinafter described in Article V hereof) upon reasonable notice to the District Control Committees and acting upon their recommendations, shall immediately pre-

pare and adopt for use in the industry, and shall submit to the Administrator for his approval not earlier than 10 days after submitting the same to each District Control Committee (hereinafter described in Article V hereof) a standard uniform system or method of cost-accounting. Upon such approval by the Administrator all manufacturers shall maintain at all times an accurate record of all costs in accordance with such system or methods or in such other manner as will clearly indicate and make available the information required thereby. Such system or method shall specify the items which shall be included in determining each manufacturer's cost.

Sec. 2. Standard Forms.—Each District Control Committee, in coöperation with the Trade Relations Committee, shall prepare immediately standard forms for quotations and contracts for use by manufacturers producing in the district to the end of standardizing such forms as far as possible in all districts, which forms shall specify the terms and conditions under which quotations and contracts for sale shall be made. When so prepared and approved by the District Control Committees, copies of such forms shall be sent to the Trade Relations Committee, and shall be submitted by it to the Administrator for his approval. Upon the Administrator's approval thereof, no manufacturer in any district shall quote or sell lime, or lime products on terms or conditions at variance from those specified in the forms approved for that district.

Sec. 3. Methods of Selling.

(a) Establishment of Basing Points.—The practice of determining delivered prices for lime in given markets, by the utilization of a basing point or points, plus the prevailing rail freight rates, has been a long-standing custom in the industry.

Each District Control Committee (hereinafter in this code provided for) may establish for its district a basing point or points (and change or revise the same from time to time as conditions warrant), which basing point or points shall be fair and reasonable as to all interested parties, provided that in the event no such District Control Committee shall have been elected in any district within 20 days after the effective date of this code, then such basing point or points shall be established for such district by the Trade Relations Committee acting upon the recommendations of the manufacturers therein.

(b) Weighted Average District Costs.—Each District Control Committee shall determine within its own district, and from time to time revise and promulgate for the guidance of the industry, the weighted average cost of each industry product manufactured in such district. Such cost shall be based upon the costs of individual manufacturers, as provided for in Sec. I of this article. In case of a district having no District Control Committee the manufacturers in such district shall report to the Trade Relations Committee, or its designated agency, necessary data to enable the Trade Relations Committee to determine weighted average costs for each industry product manufactured in such district, and the Trade Relations Committee shall determine such costs and promulgate the same for the guidance of the industry. Such average costs shall be subject to the approval of the Administrator and the substantiating data shall be open to his inspection at all times. Such determination of cost shall be made in such manner that individual figures are kept confidential and shall not be available to competitors.

After such average cost of each industry product is so determined for any district no manufacturer in the industry shall sell any such industry product for delivery in such district at less than such average cost, plus basing rail freight. Any sale in any such district by any manufacturer at less than such average cost, plus basing rail freight, shall be an unfair method of competition.

(c) Price Publication.—Each manufacturer in the industry shall, within 10 days after the effective date of this code, file with the District Control Committee a list showing the basing-point prices, and terms and conditions of sale for each of the products offered for sale in each district by such manufacturer and after the expiration of such 10-day period every manufacturer shall at all times maintain on file with the District Control Committees a list showing the basing-point prices and terms and conditions of sale except as herein provided. Each such list shall state the date upon which it shall become effective which date shall not be less than 5 days after the date of filing such list, provided, however, that the first list of prices and terms and conditions of sale filed by any manufacturer, as above provided, shall take effect on the date of filing thereof. None of the prices and terms and conditions of sale shown in any list filed by any manufacturer, as herein provided, shall be changed except by the filing by such manufacturer with the District Control Committee, of a new list of basing-point prices and terms and conditions of sale which shall become effective on the effective date therein specified, which shall not be less than 5 days after the date on which such new price list and terms and conditions of sale shall have been so filed. In case any district shall not have elected a District Control Committee, then the manufacturers selling within such district shall file their prices and terms and conditions of sale for such district with the Trade Relations Committee in the same manner and under the same conditions as those above stated for filing with the District Control Committees.

All such price lists and terms and conditions of sale filed with the District Control Committee shall be immediately distributed among the manufacturers within the district, and a copy filed with the Trade Relations Committee and all such price lists and terms and conditions of sale filed with the Trade Relations Committee shall be immediately distributed to all manufacturers in the industry interested therein.

In the event that any manufacturer shall not receive sufficient notice of the filing by any other manufacturer of revisions in such other manufacturer's prices or terms and conditions of sale, as will enable him to meet such revisions of such other manufacturer on the effective date thereof, then if such manufacturer shall file with the appropriate committee such revisions in his prices and terms and conditions of sale as may be required to meet the revisions filed by such other manufacturer, within 48 hr. after receipt of notice thereof, the revisions so filed by such manufacturer shall become effective on the same date as the revisions of such other manufacturer, or if they be already effective, shall become effective immediately.

The failure of any manufacturer to adhere to his prices, terms and conditions of sale, filed as herein provided, and any other deviation from the provisions of this section shall be an unfair method of competition.

(d) Reports for the President.—The Trade Relations Committee shall, prior to the expiration of the 4-month period herein below specified, make to the President a report and recommendations as to the effect of the basing-point and average-cost provisions of this code upon prices in the industry, upon such other matters as it may deem pertinent to properly inform the President upon the operation of this section, and upon such matters as may be requested by the President or the Administrator.

The foregoing provisions with regard to basing points and average costs herein above described are experimental and tentative so far as this code is concerned, and shall continue in effect for a period of 4 months after the effective date of this code in order to afford the President an opportunity to determine upon the recommendations of the representative or representatives appointed by the Administrator to the Trade Relations Committee as hereinafter provided (which recommendations shall be made periodically or as often as the said representative or representatives deem necessary or advisable but in any event not later than 4 months after the approval date of this code) and upon the report and recommendations of the Trade Relations Committee, whether such provisions will effectuate the purposes of Title I of said National Industrial Recovery Act and whether such provisions are beneficial or detrimental to the industry or to the public; subject, however, to the reserved power of the President to cancel or modify his approval thereof and subject also to the further proviso that the establishment and revision of the basing points and average costs and the

operation of the foregoing provisions as to basing points and as to average costs shall at all times and in any particulars be subject to the review and disapproval of the Administrator. The President or the Administrator may call upon all manufacturers in the industry for such data and information as they may consider helpful for the foregoing purposes. Subject to the exercise at any time of any powers hereinbefore reserved to the President or the Administrator, the provisions of this section shall continue in effect as a part of this code after the expiration of said 4 months' period.

Information of a confidential nature shall be collected through a confidential agency and be handled in such a way that the individual costs, profits, and other like data will not be reflected in any report or publication or made available to other members of the industry.

ARTICLE IV

[Old Sec. VI.]

Unfair Methods of Competition

Sec. 1. Departure from Agreed Working Conditions.—The paying of lower [old words "wages for the various classes of employees" omitted] than the minimum wages herein prescribed, or the exaction of hours of labor in excess of the maximum herein prescribed, shall be [old word "deemed" omitted] an unfair method of competition. [Remainder of old Par. 1 omitted.]

Sec. 2. Selling Below Cost.—In addition to the restrictions contained in Subsection (b) of Sec. 3 of Article III, it shall be an unfair method of competition for any manufacturer of lime or lime products to sell below his cost as defined in the standard uniform cost-accounting system or method to be established for the industry as herein provided, except to meet a well-established competitive delivered market price for a product of similar grade and quality. If any manufacturer shall believe that any other manufacturer is selling at less than cost to meet an established delivered price but that in the particular case such selling below cost constitutes an unfair marketing practice, such manufacturer shall have the right to file a written complaint with the Trade Relations Committee. The Trade Relations Committee upon receipt of such complaint shall cause to be made an appropriate investigation by such confidential agency as it may designate, which confidential agency shall make a full report thereon to the Administrator and shall file a summary of its conclusions with the Trade Relations Committee. The Administrator, upon receipt of such report shall, in coöperation with the Trade Relations Committee, take such further action thereon as he may deem appropriate, and shall have the power to direct the manufacturer or manufacturers concerned to correct any such unfair marketing practice found to exist. [This replaces old Par. 2.]

Sec. 3. Commercial Bribery.—To give or permit to be given to the agents, employees or representatives of customers, *or prospective customers*, or *to* agents, employees or representatives of competitors' customers or prospective customers, money or anything of value as an inducement to cause their employers or principals to purchase or contract to purchase industry products, or to influence such employers or principals to refrain from dealing or contracting to deal with competitors, shall be [old word "deemed" omitted] an unfair method of competition. [Old Par. 4.]

Sec. 4. Rebates, Subsidies, etc. [Old Par. 5, unchanged except for omission of "deemed."]

Sec. 5. Lump Sum Bids and Contracts.—To submit a bid or bids for two or more commodities, one of which is lime or a lime product, in which the unit price of each commodity is not clearly stated, shall be an unfair method of competition. Accepting orders or contracts for sale at a lump sum where the contract does not specify the exact quantity, quality and unit price of the product purchased shall be an unfair method of competition. [Replaces old Par. 6.]

Sec. 6. Combination Sales.—No manufacturer shall sell or offer to sell [old word "other" omitted] commodities *other than lime or lime products* at prices below the current price list established *therefor* by *such* manufacturer [old words "quoting for each commodity" omitted] in order to influence the sale of *his* lime or lime products. *Any violation of this provision shall be an unfair method of competition.* [Old Par. 7.]

Sec. 7.—Inducing Breach of Contract.—[Old Par. 8 unchanged except for omission of "deemed."]

Sec. 8. Defamation of Competitors.—[Old Par. 9 unchanged except for omission of "deemed."]

Sec. 9.—Use of Old Packages.—The sale by a lime manufacturer to any purchaser of bulk lime which he knows is for purposes of resale in containers, shall be an unfair method of competition. [Replaces old Par. 10.]

Sec. 10. Misrepresentation.—[Same as old Par. 11.]

Sec. 11. False Branding.—[Old Par. 12 unchanged except for omission of "deemed."]

Sec. 12. Imitation of Trade Marks.—[Old Par. 13 unchanged except for omission of "deemed."]

[Old Par. 14 omitted.]

Sec. 13. Consigned Goods.—[Old Par. 15 unchanged except for omission of "deemed."]

Sec. 14. Transactions with Jobbers, Distributors or Brokers.—It shall be [old word "deemed" omitted] an unfair method of competition for any manufacturer to create or enter into relations with any jobber, distributor or broker *except subject to the condition* that such jobber, distributor or broker shall [old words "subscribe to and" omitted] agree to be bound by all the *applicable* provisions of this code relating to the sale of the various types of lime. [Remainder of old Par. 16 omitted.]

Sec. 15. Definition of Jobber, Distributor or Broker.—[Old Par. 17 unchanged.]

[Old Par. 18 omitted.]

Sec. 16. Shipments without Orders.—[Old Par. 19 unchanged except for omission of "deemed."]

Sec. 17.—Protected Contracts.—All *bona fide* contracts and [old word "contracts" omitted] /or orders for shipment for specific jobs taken before or after the effective date of this code may be protected at the price at which the contract and/or order was taken and materials sold under such protection shall be applied only on the contract and/or order for which the protection was given. [Old word "and" omitted.] Any shipment contrary to this provision shall be ["deemed" omitted] an unfair method of competition. [Old Par. 20.]

Sec. 18. Duration of Agreements.—[This section replaces old Par. 21.]

(a) *Except where otherwise necessary to meet governmental bid requirements, no manufacturer shall make any quotation which shall not expire within 15 days from date of quotation, provided, however, that any such quotation may be specifically renewed.*

(b) *Chemical Lime.—No manufacturer shall contract for agree to furnish chemical lime or chemical lime products to any purchaser for more than a calendar quarter-annual period, nor shall he make any quotation, contract or agreement for the sale of such products for any such calendar quarter-annual period, prior to* the first day of the last month of the *immediately* preceding *calendar* quarter-*annual period.*

(c) *Building Lime.—In instances where building lime is sold for specific jobs* in lieu of making specific job contracts with dealers and processors, a purchase order at the prevailing price will be considered as a sufficient binding contract with the provision that if the price advances at any time, a specific job contract will be written *within 30 days after the price advance at the price prevailing at the date of the purchase order* for the amount of lime still required.

Specific-job contracts must be supported by the dealer's original order and record of prior deliveries and the contractor's written estimate of the balance required for completion. *Where no specific job contract is made within 30 days after the price advance, then such jobs must take the advanced price.*

(d) *Agricultural Lime Products.—No Manufacturer shall contract or agree to furnish agricultural lime or agricultural lime products to any purchaser for more than a calendar semi-annual period, nor shall he make any quotation, contract or agreement for the sale of such products for any such calendar semi-annual period, prior to the first day of the*

month immediately preceding such calendar semi-annual period.

(e) *Government, State, County and Municipal Requirements.*

No manufacturer shall submit a bid prior to 10 days before *the date specified for the* opening of bids, and, *unless a longer period therefor is specified in the proposal or by applicable law, every such bid shall specify that it shall be void if* award *shall not be* made and contract executed ["with manufacturer" omitted] within *30 days after date of the opening of bids; and* only calendar quarterly contracts *shall* be accepted, unless otherwise specified in the proposal ["and specification" omitted] *or by applicable law.*

Any deviation from *the provisions of this section* shall be ["deemed" omitted] an unfair method of competition.

Sec. 19. False Classification.—The classification of lime or lime products for the purpose of determining freight charges thereon, different from the classification adopted by the industry and accepted by the rail carriers, to secure a lower freight rate, shall be an unfair method of competition.

Sec. 20. Substitution.—The marketing and selling of a product having superior qualities and higher value, in packages of a recognized inferior and lower-priced product, and so marketing at a lower price, shall be an unfair method of competition.

Sec. 21. Contingent Sales.—The purchase of materials from a buyer of lime products, made contingent on the sale of lime by a member of the industry, shall be an unfair method of competition.

Sec. 22. Splitting of Commissions.—The splitting of commissions or other compensation received by an employee or agent of the seller, with the buyer, for the purpose or with the effect of influencing a sale, shall be an unfair method of competition.

ARTICLE V

[This replaces old Sec. VIII.]

Administration

Sec. 1. Code Authority.—To effectuate the policies of the National Industrial Recovery Act and to provide for administration of this code within the industry in coöperation with the Administrator, the Trade Relations Committee of the National Lime Assn., as that committee is from time to time constituted, is hereby established as a planning and fair-practice agency for the industry. To this committee the Administrator shall from time to time and for such periods as he may specify appoint thereto, as his representatives, or as representatives of such groups as he may designate, not more than three members without vote.

The President or the Administrator may upon complaint and after such hearing as he may prescribe, take such action as he may deem necessary to insure that the Trade Relations Committee is fairly representative of the districts and of the industry as a whole.

Sec. 2. Trade Relations Committee.—In addition to the powers and duties herein specifically conferred upon the Trade Relations Committee, it shall have the following powers and duties:

(a) The Trade Relations Committee shall have the right to establish its own rules for the conduct of *its* business ["of the committee" omitted]. [Old Par. 1(e).]

(b) *In order that the President may be informed of the extent of observance of the provisions of this code and of the extent to which the declared policy of the National Industrial Recovery Act as stated herein is being effectuated in the lime industry, the Trade Relations Committee shall make such reports as the Administrator may require, periodically, or as often as he may direct, and each manufacturer shall, in the manner hereinafter provided, make such reports, to be sworn or unsworn as the Trade Relations Committee may specify, periodically or as often as it may direct, concerning wages, hours of labor, conditions of employment, number of employees, and other matters pertinent to the purposes of this code as the Administrator, through the Trade Relations Committee, may from time to time require.*

Each manufacturer subject to the jurisdiction of this code and accepting the benefits of the activities of the Trade Relations Committee hereunder shall pay to the Trade Relations Committee his proportionate share of the amounts necessary to pay the cost of the assembly, analysis and publication of such reports and data, and of the maintenance of the said Trade Relations Committee and its activities. Said proportionate share shall be based upon the total tonnage of quicklime and hydrated lime manufactured and sold during such representative period but not less than one year, as the Trade Relations Committee may select. The Trade Relations Committee may designate the National Lime Assn. or any other appropriate agency, to assist it in maintaining its accounts, determining such proportionate shares and in securing the collection thereof. [This paragraph replaces old Par. 3.]

At the option of any District Control Committee, such reports may be collected and compiled by it for the district. In case any District Control Committee (as hereinafter provided) or a majority of the manufacturers in any unorganized district shall require it, such reports for that district shall be collected through a confidential agency appointed by such District Control Committee, or, in the case of an unorganized district, by the Trade Relations Committee. Such information shall be kept confidential as to individual reports.

The Trade Relations Committee shall compile immediately all such records in accumulated totals and averages by districts and for all districts and distribute the same to all members in the industry.

(c) *The Trade Relations Committee may, from time to time, present to the Administrator recommendations based on conditions in the industry as they develop from time to time which will tend to effectuate the operation of the provisions of this code, and the policies of the National Industrial Recovery Act, but before any such recommendations shall be presented to the Administrator they must be first submitted to all members of the industry and receive the approval of members of the industry who in the preceding year produced at least 60 per cent. of the total industry tonnage produced in that year.*

(d) *The Trade Relations Committee shall coöperate with the Administrator in making such investigations as to the functioning and observance of any provisions of this code as the Administrator may request, through such confidential agency or agencies as he may designate. All information so collected shall be kept strictly confidential except as the same is reported to the Administrator and except as may be disclosed by the Administrator for the purpose of enforcing the provisions of the National Industrial Recovery Act.*

(e) *In order to facilitate the application and operation of the provisions of this code, the Trade Relations Committee may issue interpretations thereof, subject to an appeal to the Administrator in the manner hereinafter provided.*

(f) *The Trade Relations Committee may from time to time appoint such subcommittees or designate such agencies, and may delegate to any of them such of its powers and duties, as it shall deem necessary or proper.*

Sec. 3. Lime-Industry Districts.—The industry shall be divided into "Lime-Industry Districts" which districts initially established are set forth in Schedule "A" to this code. The Trade Relations Committee may from time to time revise such districts or any of them, subject to the approval of the manufacturers within the district or districts affected, and subject to the approval of the Administrator.

The manufacturers in each district may, at a meeting called for that purpose on notice to all manufacturers in such district, at which meeting each manufacturer shall be entitled to one vote, establish therefor, upon the majority vote of the manufacturers in attendance at such meeting, a District Control Committee to consist of such number of members as such manufacturers shall determine. In order to provide, as far as practicable and as not otherwise required by this code, for the administration of this code within each district by the manufacturers therein, the district Control Committee, in addition to the duties and powers elsewhere in this code conferred upon them, shall be charged

(Continued on page 32)

Canada Cement Co. Converts Plant at Port Colborne to Wet Process*

Builds New Raw-Grinding and Kiln Departments and Improves Others

By SHIRLEY BARR
Chief Engineer, Canada Cement Co.

THE correcting, mixing and storage basins for the finished slurry are arranged for gravity flow from one basin to another. The slurry from the raw-mill pumps is discharged into four reinforced-concrete correcting tanks, 20 ft. in diameter by 14 ft. deep, each tank holding about 420 bbl. of slurry. These tanks are arranged in pairs and the slurry in each pair is agitated by a double mechanical-and-air agitator. The bottom of the correcting tanks rests on a reinforced-concrete platform about 2 ft. above the top of the quadruple mixing basin.

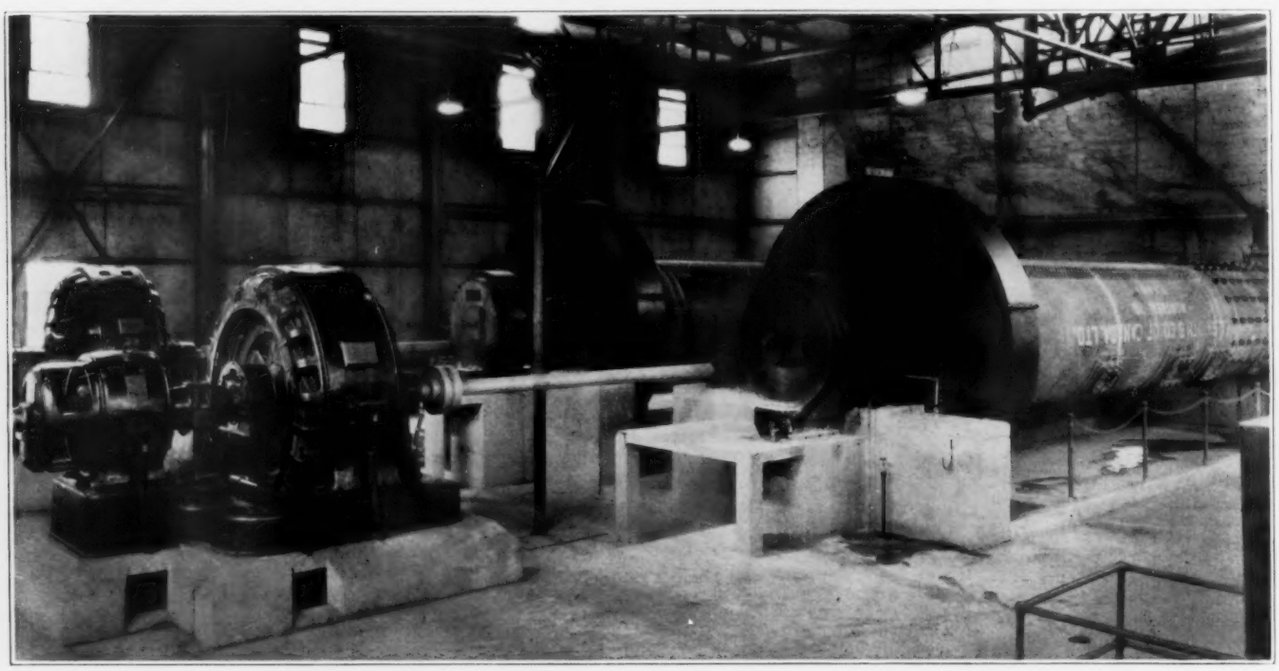
After the slurry in the correcting tanks has been analyzed it is discharged by gravity in proper proportion through slide-gate valves into the mixing basin. This is also of reinforced concrete, 20 ft. wide, 50 ft. long and 20 ft. deep, and the slurry is further agitated by four mechanical agitating units, all which are driven from a common bevel-pinion shaft. The slurry is fed into this mixing basin at the top and is discharged from the mixing basin at the bottom through a seal or trap, which always leaves 17 ft. of slurry in the mixing basin. This arrangement assures that all the slurry will pass down through the agitating arms to the bottom before it can pass through the seal into the slurry-storage basin, and avoids the possibility of the slurry short-circuiting through the mixing basin before it has been thoroughly mixed.

The slurry-storage basin is of reinforced concrete, 35 ft. wide, 145 ft. long and 20 ft. deep, and holds about 12,000 (350-lb.) bbl. of slurry. The slurry in this basin is agitated by a Smidth triple-traveling agitator similar to that used on the clay-storage basin. The slurry-storage basin is large enough to run the plant for four days which is ample to take care of Sundays, holidays and machinery overhauls in the raw-grinding department.

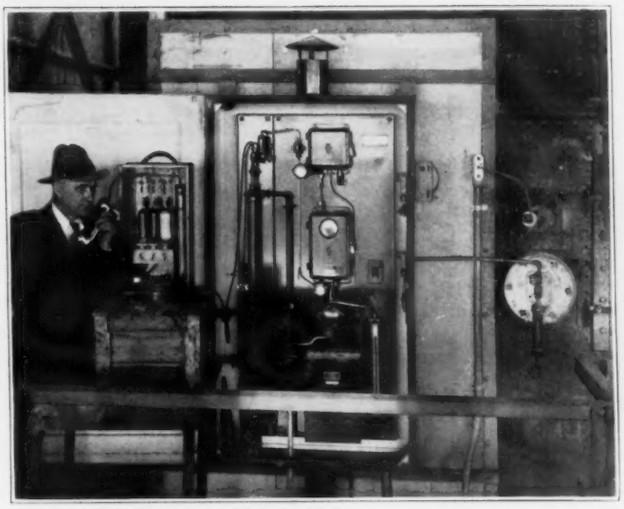
Both the clay-storage and the slurry-storage basins were constructed without covering buildings but were placed alongside the kiln building so that a building could be easily erected over the basins in case trouble developed in winter from extremely cold weather. The correcting and mixing basins are inclosed in a building adjoining and opening into the kiln building. The heat from the kiln keeps this portion of the basin department warm at all times.

Lifting trusses equipped with four 15-ton chain-

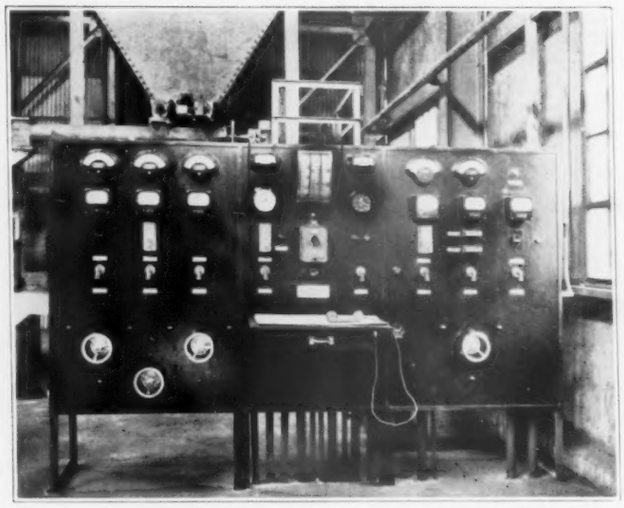
* Continued from October issue.



Raw-grinding compartment mills and 600-hp. auto-synchronous motors.



The continuous gas analyzer and checking apparatus.



The kiln-control board with coal feeder in background.

blocks are installed over each storage basin to lift the entire traveling agitator clear of the slurry in case of damage to the agitator arms or the compressed-air nozzles.

The slurry flows from the storage by gravity through slide-gate valves to two 4-in. by 13-in. Model C Wilfley pumps, which raise the slurry to the kiln-feeder tank at the east end of the building. Another 4-in. Wilfley pump is installed to take slurry direct from the mixing tank and discharge it to the kiln feeder. This provision was made so that the chemist could make a quick change in the analysis of the raw material going to the kiln in case of necessity. This pump is also used to empty the mixing tank whenever mechanical repairs to the agitators are necessary.

All the pressure and overflow pipes handling both the clay slurry and cement slurry are made of cast iron with flanged ends. All the fittings are flanged cast iron and all the elbows are fitted with clean-out flanges at their backs. Cast-iron pipe was adopted because of the excessive wear on steel pipes encountered at other plants, particularly on the overflow pipes from the kiln feeder and clay feeder. Merco-Nordstrom self-lubricating stop-cocks are used in all slurry lines and air lines.

Slurry Feeding.—The slurry from the storage-department pumps is discharged into the constant-level tank of a Smidth slurry feeder, which is different in design from anything which had been previously used by the company. Instead of a standard scoop feeder connected to a speed transformer and motor, there is a feeder with an adjustable center diaphragm inside the scoops. The slurry picked up by the scoops is divided by this center diaphragm, part going to the kiln-feed pipe and part returning to the feeder tank. This arrangement does away with the necessity of a speed transformer on the feeder drive. The normal speed of the feeder when the kiln is running at full capacity is from 6½ to 7 r.p.m.

The feeder capacity is calibrated by means of a control bucket and a stop-watch. The control bucket has a known capacity in cubic feet, and a stop-watch is used to determine the length of time required for the feeder to fill the control bucket. Once the desired ratio has been established, the feed going into the kiln during each revolution will remain constant at any speed at which the kiln may be operating, provided the level of the slurry in the feeder tank does not change. The only trouble experienced with this feeder has been to maintain a constant level in the feeder tank. When the slurry-storage basin is full, the Wilfley pump will deliver more slurry per minute than it will when the basin is half full, due to the decrease in head on the pump. This variation in the rate of discharge from the slurry pump affects the level of the slurry in the feeder tank, which in turn causes the feeder scoop to discharge a varying amount of slurry per revolution with the same setting of the diaphragm. This trouble is being corrected by the installation of an auxiliary feeder tank into which the slurry from the pump will be discharged. The slurry will then flow to the feeder tank by gravity under a constant head and should maintain a very constant level in the tank. As now operating, the kiln feeder delivers about 2 cu.ft. of slurry per revolution, the water content of which averages 35 per cent. The feeder averages 11,000 revolutions per day for an average kiln production of 2,650 (350-lb.) bbl. per day.

The slurry feeder is driven by a special 3-hp., 450-to-1,100-r.p.m. synchronous motor through a No. 4 D. A. Falk reduction unit having a ratio of 49 to 1. A chain drive connects the slow-speed shaft of the reducer to the feeder shaft. The motor is electrically-connected in series with a 5-kv.-a. 450-to-1,100-r.p.m. a.-c. generator which is direct-connected to the extended shaft of the 75-hp. d.-c. kiln-drive motor. The speed of the slurry-feeder motor, therefore, varies directly with any changes in the kiln speed. The feeder can not get out of step with the kiln once the ratio has been fixed. The only way to change this ratio is to change the sprockets on the feeder drive. The adjustable diaphragm will give a feed varying from 1.08 cu.ft. to 3.25 cu.ft. per revolution, which are well below and above the minimum and maximum kiln requirements. The excess slurry flows back to the storage basin by gravity.

Kiln Construction.—The rear housing of the kiln is built of structural-steel beams and plates, the beams being so arranged as to resist external air pressure. This housing was kept free from the building structure so that it could expand horizontally and vertically without restraint. The pipes for the pyrometer, draft gage and gas analyzer are supported on the back wall of the housing and the kiln-feed pipe passes through the rear wall by means of a slip-joint. A platform is installed just back of the rear housing at a height suitable for serving the various pipes. The electric gas analyzer is also located on this platform.

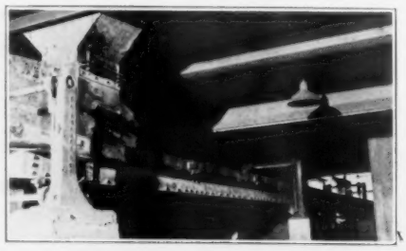
A counterweight-operated Smidth air-seal is placed around the kiln where it projects through the wall of the rear housing. This seal is quite effective and reduces air leakage into the exit gases to a minimum. This is important, as air leaking into the rear housing will greatly increase the power required to operate the induced-draft fan.

This is a No. 45 Smidth steel-plate fan, with overhung blast wheel and water-cooled bearings. It is driven by a 1¼-in. pitch by 8-in. wide silent-chain unit having a speed ratio of 3 to 1. The high-speed chain sprocket is mounted on the shaft of a 75-hp. 900-to-1,200-r.p.m. 220-v. d.-c. motor. While this is a variable-speed motor, it is not used as such to regulate the draft and is not under the control of the burner. It is difficult to predetermine the correct speed at which to run an induced-draft fan of this size and unless a variable-speed motor is installed it may be difficult and expensive to adjust the fan speed to suit the kiln. At Port Colborne it was found that the most suitable speed for the fan was about 320 r.p.m. The draft fan delivers about 100,000 cu.ft. of flue gas per min. at temperatures ranging from 425 deg. to 450 deg. F. when running at a speed of 320 r.p.m. The draft on the kiln is controlled by a motor-operated Smidth *louvre* damper located between the rear housing and the fan intake. This damper can be opened or closed at will from the burner's platform.

The gases from the draft fan are discharged through a steel flue to the base of a 10-ft. reinforced-concrete stack 300 ft. high. This stack has a self-supporting brick lining built entirely separate from the concrete shell and carried to the full height of the kiln stack.

The kiln and its auxiliaries represent the most modern ideas on kiln design as recommended by the school of cement engineers which advocates extremely long kilns with regenerative chain systems at the feed ends, elongated calcining zones, and integral regenerative clinker coolers at the firing end. Inasmuch as hydroëlectric power was available at Port Colborne it was deemed inadvisable to install a waste-heat power-plant and it, therefore, seemed that the most economical kiln was one which would give the lowest exit-gas temperatures.

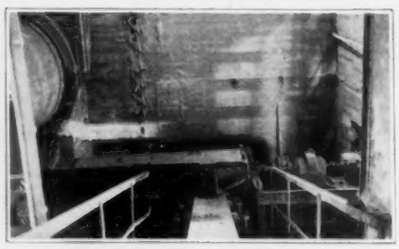
Therefore a kiln, 11 ft. 5 in. and 10 ft. 2 in. and 11 ft. 5 in. in diameter by 412 ft. long, equipped at the feed end with a regenerative chain system and at the discharge end with Unax coolers which are attached to and revolve with the kiln, was chosen. The chain system at the feed end extends for a distance of 82 ft. 4 in. toward the feed end.



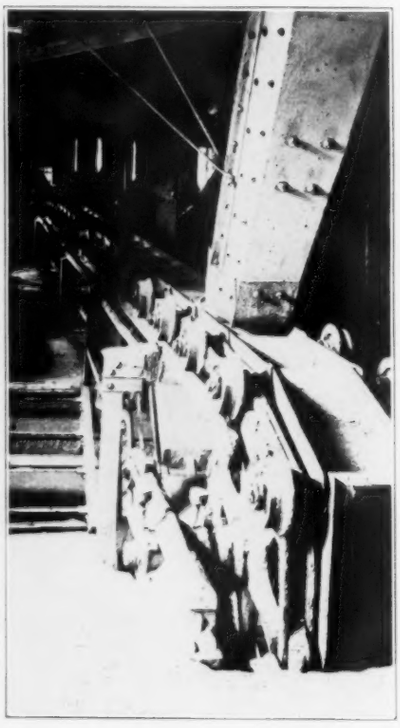
Chute from cooler feeding reciprocating clinker conveyor which discharges to finish-grinding department.

Drag-line scraper working in clinker storage.

One of the six screen-type preliminary clinker grinding mills which discharge to tube-mills for finish grinding.



Screw-conveyor under tube-mill discharge, motor and reducer. Belt to stock-houses in foreground.



Pan-conveyor handling clinker to finish-grinding tube-mills.

TABULAR ANALYSIS OF THE OPERATIONS AND EQUIPMENT OF THE CANADA CEMENT CO., PORT COLBORNE, ONT., CANADA

(Key numbers refer to corresponding numbers on accompanying flow-sheet)

	Operation	Key	Equipment	Make	Model No., Size, Capacity or Type	Power Source	Power Transmission
High-Calcium Stone	Receipt, storage and reclamation	1a	Track-scale (same as 3d)	Canadian Fairbanks	125-ton		
		2a	Open storage				
			Overhead crane	Dominion Bridge Co.	80-ft. span		
			Clam-shell bucket (From 2a and 11A$_2$)	Mead Morrison	2-cu. yd.		
		3a	Hopper				
		4a	Belt-conveyor (No. 2) (To 10)	Dodge-Timken, Goodyear	20-in.		
Clay	Loading	1b	Shovel	Marion	Model 21, electric		
	Transportation	2b	Trucks	Mack	5-ton		
		3b	Cars (2)	Western	12-cu. yd. side-dump		
			Locomotive (same as 2)	Vulcan	50-ton saddle-tank, steam		
	Storage, agitation and feed	4b	Hopper				
		5b	Wash-mill	Smidth	26-ft.-diameter by 10-ft.	75-hp., 480-r.p.m. motor	Bevel gear and pinion
		6b	Screens				
		7b	Sump				
		8b	Pumps (2)	Wilfley	4-in.	40-hp., 1,500-r.p.m. motors (2)	Direct-connected
		9b	Storage basin		35-ft. by 84-ft. by 20 ft. deep		
			Agitator	Smidth	Triple traveling, mechanical-and-air	Travel 10-hp., 500-r.p.m. motor	Cleveland No. 500 reducer
						Agitator 10-hp., 500-r.p.m. motor	Foote reducer
		10b	Pumps (2)	Wilfley	4-in., Model C	30-hp., 1,500-r.p.m. motors (2)	Direct-connected
		11b	Feeder tank (To 12, overflow to 9b)	Smidth	Screw-agitation, constant-level	5-hp., 1,500-r.p.m. Canadian G. E. motor	Cleveland No. 100 worm-gear reducer
Gypsum	Receipt and handling	1c	Locomotive crane (same as 1d)	Northwest	15-ton gasoline		
		2c	Cars (same as Locomotive 2d)				
		3c	Track-scale (same as 1a)				
		4c	Track-hopper				
		5c	McCaslin conveyor		24-in.	10-hp., 750-r.p.m. motor	Gear train and belt
		6c	Hammer-mill	Jeffrey	24-in. by 20-in.	35-hp., 500-r.p.m. motor	Texrope 7-rope drive
		7c	Belt-conveyor	Dodge-Timken, Goodyear	20-in.	5-hp., 1,500-r.p.m motor	Cleveland No. 200 worm-gear reducer
		8c	Hopper				
		9c	Feeder (To 24)		Reciprocating	From Skipulter shaft	
Limestone	Loading	1	Shovel	Marion	No. 37, electric, 1½-cu.yd.		
	Transportation	2	Cars (8)	Continental	6-cu. yd., side-dump		
			Locomotive (same as 3b)	Vulcan	50-ton, saddle-tank, steam		
			Hoist	Lidgerwood		50-hp., 500-r.p.m. motor	
		3	Track-scale	Fairbanks	30-ton		
	Primary crushing	4	Primary crusher	Allis-Chalmers	McCully No. 11 right-angle drive	150-hp., 500-r.p.m. motor	Belt
		5	Bucket-elevator		42-in. belt	Crusher pinion-shaft	Bevel gears
		6	Feed hopper				
		7	Apron feeder	Jeffrey		Hammer-mill main shaft	Belt and jaw clutch
	Secondary crushing	8	Hammer-mill	Jeffrey	42-in. by 48-in., Type B	150-hp., 750-r.p.m. motor	Direct-connected
		9	Belt-conveyor (No. 1)	Dodge, Timken, Goodyear	24-in.	10-hp., 750-r.p.m. motor	Falk No. 6DA reducer
		10	Belt-conveyor (No. 3)	Dodge, Timken, Goodyear	24-in.	35-hp., 750-r.p.m. Canadian G.E. motor	Falk No. 8 reducer
		11	Raw-mill bins (To 12 or 11A$_1$)		Reinforced-concrete		
	Open storage		(From 11)				
		11A$_1$	Cars				
		11A$_2$	Open storage (To 3a)				
Raw-material grinding			(From 11 and 11b)				
		12	Feeders	Smidth			
		13	Raw mills (2)	Smidth Unidan	7-ft. by 39-ft.	600-hp. Peebles synchronous induction motors (2	Direct-connected to mill pinion-shaft
Slurry correcting and mixing		14	Sump				
		15	Pumps (2)	Wilfley	4-in.	40-hp., 1,500-r.p.m. motors (2)	Direct-connected
		16	Correcting tanks (4)		20-ft.-diameter by 14 ft. deep, concrete		
			Agitators	Smidth	Double, mechanical-and-air	10-hp., 750-r.p.m. motors (2)	Driven in pairs through No. 6 Falk reducers
		17	Mixing basin		20-ft. by 50-ft., concrete		
			Agitator (To 17a or 18)	Smidth	Quadruple, mechanical-and-air	20-hp., 750-r.p.m. motor	Falk No. 7 right-angle reducer
Optional flow			(From 17)				
		17a	Pump (To 20)	Wilfley	4-in.	40-hp., 1,500-r.p.m. motor	Direct-connected
Slurry storage and feeding			(From 17)				
		18	Storage basin		35-ft. by 145-ft. by 20-ft. deep, concrete		
			Agitator	Smidth	Triple traveling, mechanical-and-air	Travel 10-hp., 500-r.p.m. motor	No. 500 Cleveland reducer
						Agitator 10-hp., 500-r.p.m. motor	Foote reducer
		19	Pumps (2)	Wilfley	4-in. Model C	40-hp., 1,500-r.p.m. Canadian G.E. motors (2)	Direct-connected
		20	Kiln feeder	Smidth		3-hp., 450-to-1,100-r.p.m. synchronous motor	Falk No. 4 reducer and chain

(*Continued on page 27*)

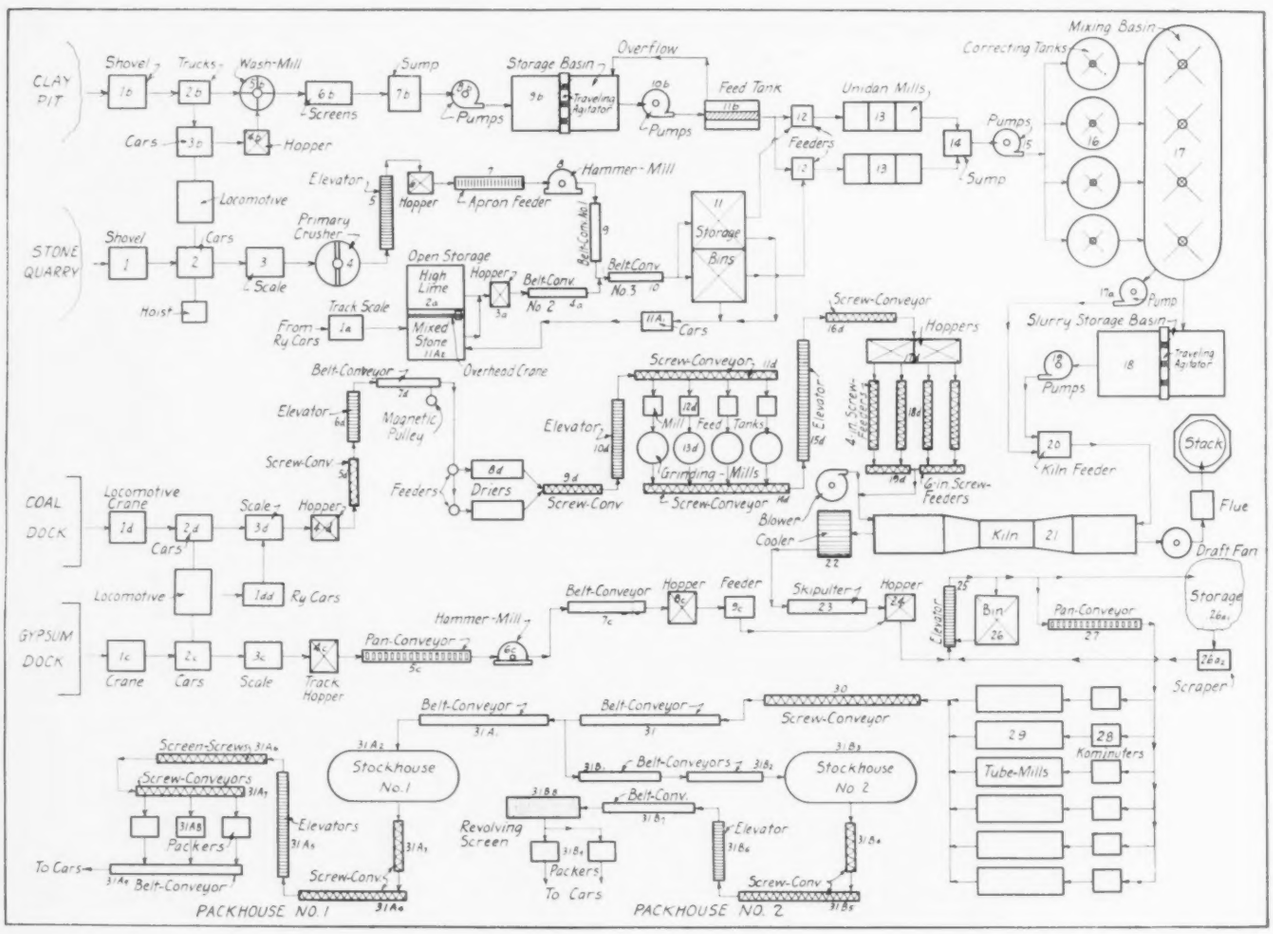
There is a total of 15,447 ft. of chain weighing about 65,000 lb. The large diameter of the kiln at the feed end was used to allow the installation of the greatest length of chains possible in order to reduce the temperature of the exit gases. These temperatures average from 425 to 450 deg. F. The chain system, in addition to increasing the thermal efficiency and capacity of the kiln, also serves as an excellent dust-collector, reducing the dust loss to a low figure, and eliminates to a large degree the dust nuisance commonly caused by kiln stacks.

Between the chain system and the feed end of the kiln, gas outlet pipes, which allow a large percentage of the kiln gases to be discharged through the side of the kiln shell into the rear housing, are installed. This arrangement allows the closing of the feed end of the kiln to a 4-ft.-diameter opening, which eliminates all slurry spillage into the rear housing. These gas outlets do not block the flow of the slurry down the kiln.

The feed end of the kiln as far as the chain system extends is lined with 4½-in. second-quality firebricks and for a length of 156 ft. below the chain system 4-in. second-quality firebricks are used. These bricks are placed on the top of 2½-in. Moler insulating bricks. The calcining zone is lined with 8-in. first-quality firebricks and the burning zone with 8-in. high-alumina bricks. Just above the clinker-discharge outlets is a brick ring 16 in. thick which builds up a deep bed of material in the clinkering zone. This dike is distinctly beneficial. The best life secured from the high-alumina brick in this kiln is 3,165 hr., during which time 350,000 bbl. of clinker was produced. About 22 ft. of lining has to be replaced each time the burning zone is relined.

Cooling.—The clinker coming from the burning zone is discharged through ten necks into the Unax coolers. These necks are lined with heat-resisting castings. Some of these castings have been in use at other plants of the company for four years without replacements. Each of the 10 Unax cooler cylinders is 4 ft. 10 in. diameter and 20 ft. long, the first 5 ft. of length being lined with 4-in. wear-resisting bricks and the remainder of the cooler is filled with a system of chains similar to those in the feed end of the kiln. There is a total of 2,570 ft. of chain in each cooler section, or nearly 5 mi. in the 10 cooler cylinders. The total weight of the cooler chains is slightly over 19 tons. The chains in the hot end of the cooler gradually oxidize and disappear and it is thought that these should be made of heat-resisting steel. There is apparently no wear on the remainder of the cooler chains provided the chains at the hot end are maintained.

These integral coolers are not an unalloyed joy to the kiln foreman and the master mechanic, but they are effective in increasing the kiln efficiency.



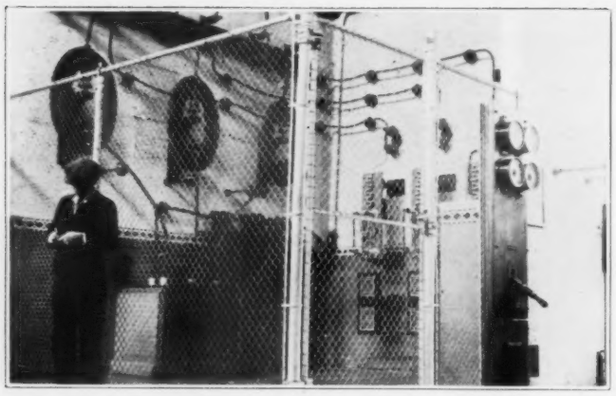
Flow-sheet of the Port Colborne plant of the Canada Cement Co., Ltd.

TABULAR ANALYSIS OF THE OPERATIONS AND EQUIPMENT OF THE CANADA CEMENT CO., PORT COLBORNE, ONT., CANADA

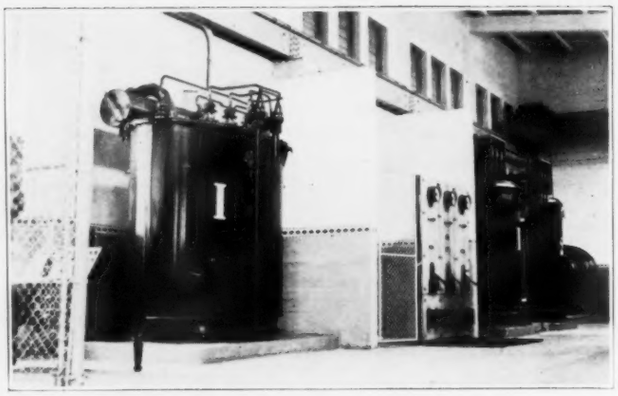
(Continued)

(Key numbers refer to corresponding numbers on accompanying flow-sheet.)

Operation	Key	Equipment	Make	Model No., Size, Capacity or Type	Power Source	Power Transmission
Clinker burning and cooling	21	Kiln	Smidth	11-ft. 5-in., 10-ft. 2-in. and 11-ft. 5-in. by 412 ft. long	75-hp., d.-c., 400-to-1,100-r.p.m. B.T. H. motor with 5-kv.-a., a.-c. generator for feeder drive	Kennedy-Falk No. 12½ D A reducer
	22	Cooler	Smidth Unax	4-ft. 10-in. by 20-ft. cylinders (10)		
	23	Reciprocating conveyor (To 24)	Smidth Skipulter	18-in. by 62-ft.	15-hp., 500-r.p.m. Canadian G.E. motor	Lenix drive
Finished-material-grinding		(From 23 and 9c)				
	24	Hopper				
	25	Bucket-elevator		18-in.		
	26	Bin				
	27	Pan-conveyor	Bartlett & Snow	15-in. by 24-in.		
	28	Screen-type mills (6)	Smidth Kominuter	No. 66 and No. 85	75-hp., 500-r.p.m. motors (4) 100-hp., 500-r.p.m. motors (2)	Belt
	29	Tube-mills (6)	Smidth	No. 18	175-hp., 500-r.p.m. motors (6)	Belt
Clinker storage and rehandling	26a1	Storage-pile				
	26a2	Drag-scraper (To 25)	Sauerman Crescent	¾-cu.yd.		
Cement Storage and Packing — Cement handling	30	Screw-conveyor		16-in.	15-hp., 750-r.p.m. motor	Tool Steel Gear & Pinion Co spur-gear reducer
	31	Belt-conveyor (To 31A1 or 31B1)	Goodyear	24-in., inclined	20-hp., 750-r.p.m. motor	No. 500 Cleveland-reducer
Stock-house No. 1	31A1	Belt-conveyor	Goodyear	24-in.	15-hp., 750-r.p.m. motor	Belt
	31A2	Bin storage		12-in.		
	31A3	Screw-conveyors (14)		12-in.		
	31A4	Screw-conveyors (3)				
Pack-house No. 1	31A5	Bucket-elevators (2)		16-in.		
	31A6	Revolving screens (2)			75-hp., 500-r.p.m. motor	Line-shaft and belts
	31A7	Screw-conveyors		12-in.		
	31A8	Bag-packers (3)	Bates	3-spout		
	31A9	Belt-conveyor	Goodyear	30-in.	15-hp., 750-r.p.m. motor	No. 200 Cleveland reducer
Stock-house No. 2	31B1	Belt-conveyor	Goodyear	24-in., inclined	10-hp., 750-r.p.m. motor	Belt
	31B2	Belt-conveyor	Goodyear	24-in., monitor	10-hp., 750-r.p.m. motor	
	31B3	Bin storage				
	31B4	Screw-conveyors (5)		16-in.	10-hp., 750-r.p.m. motor on car	Belts to all five screws
	31B5	Screw-conveyor (1)		18-in.		Line-shaft
Pack-house No. 2	31B6	Bucket-elevator		18-in.		Line-shaft
	31B7	Belt-conveyor	Goodyear	24-in.		
	31B8	Revolving screen				
	31B9	Bag-packers (2)	Bates	4-spout, 12-in.	10-hp., 1,500-r.p.m. motors (2)	Silent chain
Coal — Receipt, storage and preparations	1d	Locomotive crane (same as 1c)	Northwest	15-ton, gasoline		
	2d	Cars / Locomotive (same as 2c) (To 3d)		50-ton, hopper-bottom		
	1dd	Railroad cars (To 3d)				
	3d	Track-scale (same as 1a)	Fairbanks	125-ton		
	4d	Car-dump hopper				
	5d	Screw-conveyor		12-in.	From 8d	Line-shaft
	6d	Bucket-elevator		16-in.		
	7d	Belt-conveyor	Goodyear	20-in.	15-hp., 750-r.p.m. motor	Hamilton spur-gear reducer
		Magnetic pulley		22-in. by 22-in.		
	8d	Drier feeders (2)	Smidth	Table		
		Driers (2)	Ruggles-Coles	6-ft. by 30-ft.	75-hp., 500-r.p.m. motor	Line-shaft
	9d	Screw-conveyor		12-in.		
	10d	Bucket-elevator		12-in.	15-hp., 750-r.p.m. Canadian Westinghouse motor	Falk No. 60A reducer
	11d	Screw-conveyor		12-in.		
	12d	Grinding-mill tanks (4)		12-in.		
	13d	Grinding mills (4)	Fuller	42-in.	100-hp., 500-r.p.m. motors (4)	Belt
	14d	Screw-conveyor		12-in.	10-hp., 750-r.p.m. motor	Falk No. 5 HA reducer
	15d	Bucket-elevator		12-in.	10-hp., 750-r.p.m. motor	Falk No. 6 DA reducer
	16d	Screw-conveyor		12-in.	10-hp., 750-r.p.m. motor	Falk No. 5 DA reducer
	17d	Powdered-coal tanks (2)		7-ft. by 8½-ft. by 11-ft.		
	18d	Screw-feeders (4)		4-in.	3-hp., 1,200-to-2,400-r.p.m., d.-c. B.T.H. motor	No. 100 Cleveland reducer and bevel gears
	19d	Screw-feeders (2)		6-in.		Link-Belt roller-chain
		Blower (To 21)	Canadian Blower & Forge Co.	48-in.	30-hp., 1,700-to-2,200 r.p.m., d.-c. motor	Direct-connected
Miscellaneous		Air-compressor	Ingersoll-Rand	24-in. and 15-in. by 22-in., Class D2	250-hp., 500-r.p.m. motor	Belt
		Auxiliary kiln drive			Buda YTU, 4-cyl., 42-hp. gasoline engine	Bush roller-chain
		Auxiliary generator		125-kv.-a.	Vickers-Petter 120-hp. Diesel engine	Belt
		Kiln stack	Custodis Chimney Co.	300-ft. by 10-ft. in diameter, reinforced-concrete		
		Draft fan	Smidth	No. 45	75-hp., d.-c. motor	Chain
		Bag-cleaners (2)				

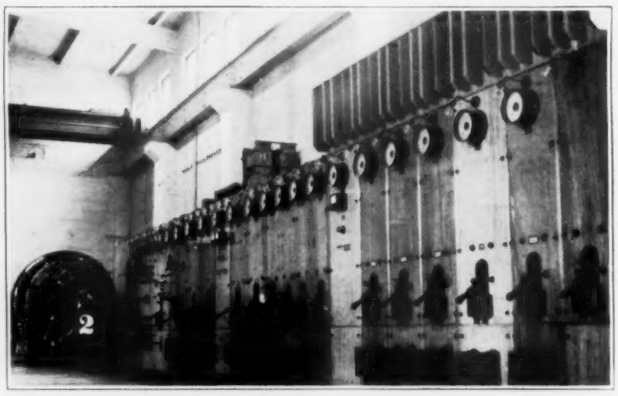


High-tension room of the substation.



The 2,200- and 440-v. transformers.

The secondary air passing through the coolers is preheated to about 920 deg. F. and the clinker is discharged from the coolers at a temperature of less than 300 deg. F., when the kiln production is 2,650 bbl. per day, resulting in a clinker of easy grindability.



Substation switch-board and No. 2 condenser.

The kiln is supported and revolved on 6 cast-steel tires, 5 of which are floating, only the thrust tire being riveted to the kiln shell. The floating tires are shimmed so as to leave a small distance between the tire and the shims at the top when the kiln is cold. The hot-zone tires have more clearance than the others. The floating tires creep from ¼ in. to ⅜ in. per kiln revolution. Great care was taken in setting the thrust tire in order to make sure that it would be exactly at a right angle to the longitudinal center-line of the kiln. This was necessary because the entire end-thrust load of the kiln is taken on the edge of the thrust tire, and it is therefore very essential that the contact between the thrust roller and the thrust tire remain constant for the full revolution of the kiln. This is especially true when the faces of the tires and rollers are lubricated continuously as they are at this plant. With lubricated tires and rollers the kiln runs downhill very fast, if the thrust tire loses contact with the thrust roller. The thrust roller then has to force the kiln uphill when contact is renewed and this throws an excessive load on the bearings of the thrust roller.

Each tire is carried on two 48-in.-diameter cast-steel supporting rollers which vary in width from 26 in. to 30 in., according to the tire loading. The supporting rollers are fitted with cylindrical-roller anti-friction bearings, which are mounted inside the rollers, the supporting roller shafts being dead. Each supporting roller runs in a pan of cooling water and a film of oil is maintained on the surface of the water. The water keeps the temperature of the roller and bearings down to a point where lubricating grease can be kept in the bearings and the oil film on the water lubricates the surfaces of the tires and rollers, keeping them in good condition.

Each roller-bearing assembly contains an individual thrust bearing, designed to care for the thrust set-up in each assembly only. It was not intended that these thrust bearings should take any of the end thrust of the kiln but only such thrust as would be set up in case the supporting roller shafts were not set exactly parallel with the kiln. Extreme care was taken to set the rollers as nearly parallel with the kiln as possible so as to avoid setting up internal end thrust in each roller-bearing assembly.

The entire end thrust of the kiln (amounting to 120,000 lb. by test) is taken on a heavy thrust-roller assembly located at and attached to the supporting-roller base for tire No. 3. This thrust roller is also equipped with radial and thrust roller-bearings. An electric contact is installed at the thrust tire which will shut down the kiln motor in case any part of the thrust-roller assembly fails.

So far the anti-friction bearings on the Port Colborne kiln rollers have stood up very well, but the kiln has not yet run long enough for any serious trouble to develop. Anti-friction bearings are almost a necessity on extremely long kilns, otherwise the power required to start the kiln in cold weather would be very high. With anti-friction bearings the starting load for the 412-ft. kiln is 100 hp., and the running load is 55 hp. when the kiln is fully loaded. The high speed of the kiln is 1.26 r.p.m. and the low speed .46 r.p.m. Owing to depressed business conditions the kiln has not been pushed for production. It is operated at a speed of about 68 sec. per rev. and produces from 2,600 to 2,700 (350-lb.) bbl. per day.

Platforms were built around the tops of all supporting piers to give easy access to the rollers and bearings, and beam trolleys are provided over each

tire to assist in changing a roller quickly in case of a bearing failure. Complete spare supporting-roller assemblies are always ready in case of need. A 250-ton hydraulic jack placed under the tire between the supporting rollers is used to raise the kiln when changing a roller.

The kiln is driven by a 75-hp., 400/1100-r.p.m., 220-V. d.c. motor through a No. 12½ D. A. Kennedy-Falk reducer having a ratio of 70 to 1 and a single helical master gear and pinion set having a ratio of 12½ to 1, making a total reduction of 875 to 1. A Westinghouse solenoid brake is mounted on the kiln-drive motor shaft to prevent the kiln from running backwards when the power is cut off. A 5-kv.-a. a.-c. generator is direct-connected to the end of the motor shaft which is electrically connected in series with the slurry-feeder motor as previously described. A kiln-revolution counter, driven from the generator shaft, is electrically-connected to a Veeder recorder mounted on the operating panel.

An auxiliary Buda 42-hp. gasoline engine, which can be quickly connected to the high-speed shaft of the reducer by sprockets, is installed on the drive pier. This engine will turn the kiln slowly and prevent warping of the kiln shell in case of electric-power failure when the kiln is hot. This provision is essential where electric power is purchased for plant requirements.

Coal Processing and Feed.—Coal for the plant's requirements is received either by railway or water. Railway shipments are delivered direct to the coal mill after having been weighed on a 125-ton track-scale.

The coal coming in by water is delivered by self-discharging steamers to the dock located along the old Welland Canal, where it is stored until required at the plant. Sufficient coal for the winter run can be stored on the dock. The coal is loaded as required into 50-ton hopper-bottom cars by a Northwest gasoline locomotive crane, and the cars are hauled to the plant, ½ mi. distant, over a private railway belonging to the company. These cars are also weighed on the track-scale before they are delivered to the coal mill. The superintendent, therefore, has accurate information as to the weight of the coal going to the kilns, the only variable being the moisture content in the coal. A series comprising a screw-conveyor, a bucket-elevator and a belt-conveyor feeds the driers. A magnetic pulley on the head end of the belt-conveyor removes any metal that may be present.

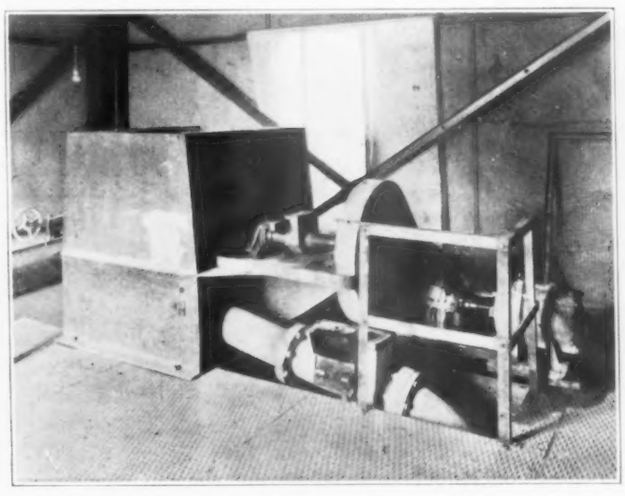
The coal is dried in two 6-ft. by 30-ft. rotary driers and then ground by four 42-in. Fuller mills, after which it is delivered to two 7-ft. by 8-ft. 6-in. by 11-ft. powdered-coal tanks located on the burner's platform in the kiln room. Coal is drawn from each tank by two 4-in. screws driven from a common bevel-pinion shaft. The speed of the 4-in. screws can be varied from 66 r.p.m. to 132 r.p.m. and is controlled by the burner from the operating panel. A tachometer indicates on the panel board the speed of the 4-in. screws in r.p.m., and a revolution counter records the total coal-screw revolutions for the shift and day. The 4-in. coal screws have been carefully calibrated so that the superintendent can determine very accurately the pounds of coal consumed per barrel during each shift or for the full day.

The four 4-in. screws discharge into two 6-in. screws which deliver the coal to the injector in the 9-in.-diameter blast-pipe. The coal is blown into the kiln by a 48-in. steel pressure blower having a capacity of 4,600 cu.ft. per min., 19 in. S.P. at 2,200 r.p.m. and 3,600 cu.ft. per min. 11½ in. S.P. at 1,700 r.p.m. The fan motor is also controlled from the panel board.

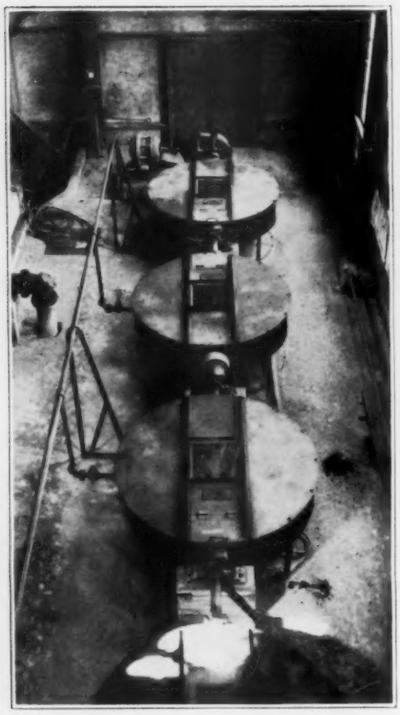
Kiln Control and Operation.—Frequent references have been made in this paper to the kiln-control panel which is located on the burner's platform, and it is from this panel that all the kiln auxiliaries are operated or upon which their performance is indicated.

A Leeds and Northrup pyrometer measures the exit-gas temperatures continuously and these temperatures are indicated on the operating panel and also recorded on a continuous chart in the superintendent's office. An alarm thermometer, set at 600 deg. F., warns the burner if the exit-gas temperature rises much above normal. This alarm

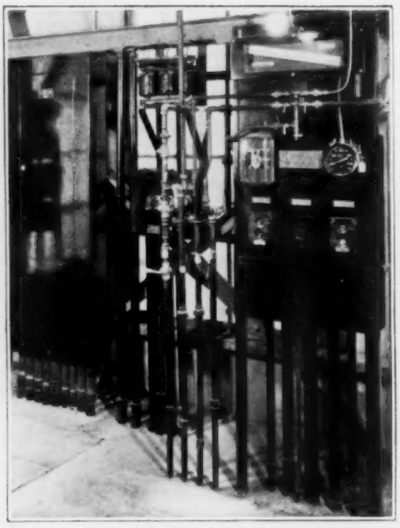
The open stone storage with 80-ft.-span overhead crane.



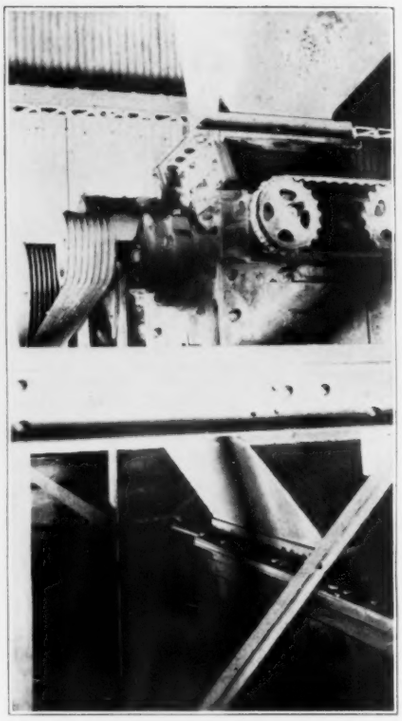
Slurry feeder with revolution counter on driven shaft.



Top view of quadruple slurry-mixing basin with agitator drive.



Instruments at feed end of kiln, safety-alarm thermometer at right.

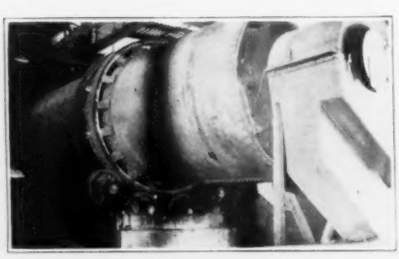


Hammer-mill and V-rope drive in gypsum department, belt-conveyor below.

sounds a Klaxon horn mounted on the panel. The draft at the feed end of the kiln is measured by an inclined draft gage and also by a Hays pointer gage which indicates the inches of draft on the operating panel. The kiln draft is controlled by the motor-operated *louvre* damper located between the fan and the rear housing. The damper motor control is on the panel and the setting of the damper is indicated on the panel.

A Siemens and Halske electric gas analyzer installed in the rear dust housing makes continuous CO_2 and $CO + H_2$ analyses of the exit gases. These analyses are indicated on the operating panel and recorded in the superintendent's office. The kiln feeder revolutions are recorded on the panel by an electrically-operated Veeder counter. A red signal light flashes on the panel board indicating that the slurry is feeding properly. The draft at the firing end of the kiln is indicated on the panel by a Hays pointer gage, as is also the pressure in the coal blast-pipe. The speed of the kiln is indicated on the panel by a tachometer in sec. per rev. and the total revolutions of the kiln are recorded by a Veeder counter. The speed of the coal screws in r.p.m. is indicated on the panel by a tachometer, and the total coal screw revolutions are recorded by a Veeder counter. This counter is not mounted on the panel but should be. Ammeters on the panel indicate the loads on the motors driving the draft fan, kiln, coal screws and coal blast fan.

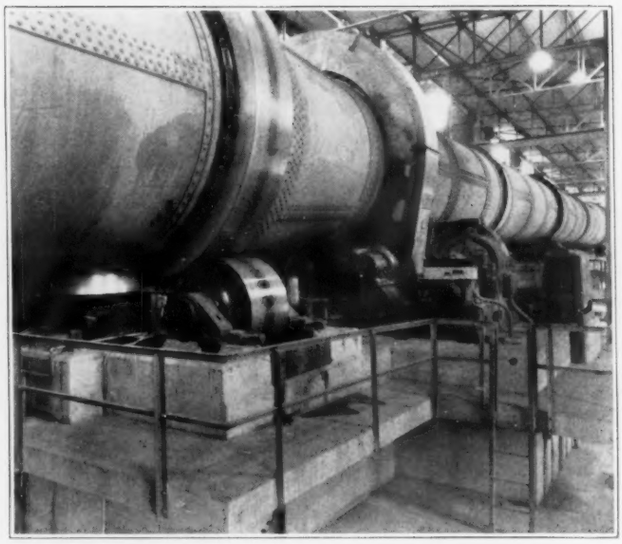
Each of the foregoing instruments gives the burner definite aid in operating his kiln. The pyrometer gives the burner his exit-gas temperatures and the gas analyzer gives him accurate and continuous information of the burning conditions in the kiln. He has positive control over the kiln draft, coal feed, blast fan, and kiln speed. The average CO_2 content of the exit gases is 28½ per cent. and the average $CO + H_2$ content is less than one-half of one per cent. These gas percentages indicate practically perfect combustion. The exit gas temperature of 450 deg. F. also indicates efficient operation. Complete daily and monthly operating charts are made.



View of the discharge end of the coal drier showing drive gear.

Drive for screws on one of the coal tanks.

The value of the gas analyzer to the operators is strongly emphasized. It tells the burner when his coal and air are in proper proportion for perfect combustion and the positive control of the coal screws and draft enables him to keep his fuel and air in proper proportions and still maintain a proper burning temperature in the clinkering zone. The burner soon learns to increase or decrease his draft as he increases or decreases the amount of coal going to the kiln. The analyzer, therefore, enables the burner to operate his kiln without either excess coal or excess air, and his knowledge of this is definite, whereas, without the analyzer, the judgment of the burner has to be relied on exclusively on this most important feature of kiln operation. The



One of the kiln thrust rollers, the drive, and auxiliary gasoline engine at extreme right.

analyzer is not difficult to maintain and adjust, and it can easily be checked for accuracy with an Orsat apparatus.

The kiln-department floor is flushed each morning and kept very clean and free from dust.

Clinker Grinding.—The clinker leaving the Unax cooler is discharged into an 18-in. by 62-ft. 4-in. Skipulter, which conveys it to a bucket-elevator. Near the discharge end of the Skipulter is a small gypsum hopper fitted with a small reciprocating feeder which is driven from the Skipulter shaft. The kiln has a known capacity of about 2 bbl. per revolution and the gypsum feeder is calibrated to deliver the proper amount of gypsum for each kiln revolution. The gypsum feeder discharges into a hopper at the end of the Skipulter and the combined materials are elevated and conveyed directly to the clinker-grinding department.

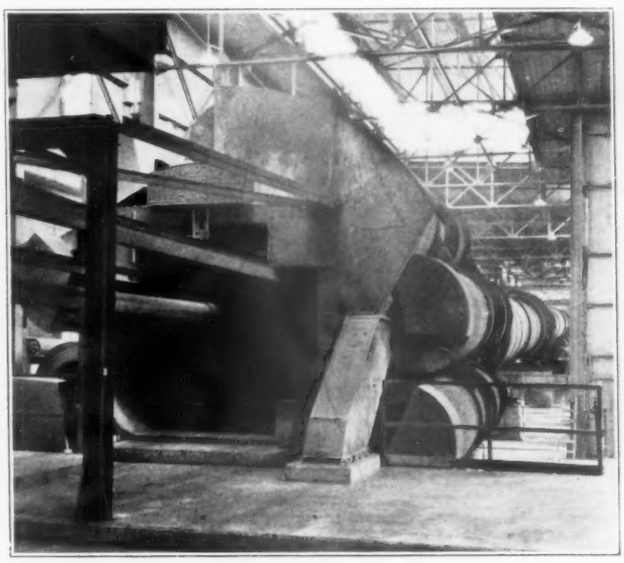
The clinker-grinding department operates only two shifts per day and a concrete storage bin receives the clinker from the kiln during the idle shift. This clinker is then fed back into the kiln run during the shifts when the clinker mills are operating. The clinker is cool enough to go direct to the grinding mills without quenching. An outside clinker storage, served by a Sauerman scraper, provides for major shut-downs in the clinker-grinding department without affecting the kiln production.

The clinker-grinding mill is unchanged except that all power circuits were placed in conduits. Four No. 66 Kominuters and two No. 85 Kominuters are used for preliminary grinding and six No. 18 Smidth tube-mills are used for finished grinding. The tube-mills produce 50 bbl. per hr. of cement which is 90 per cent. minus 200-mesh.

Cement Storage and Packing.—From the clinker-grinding department the cement is conveyed to two cement-storage buildings. No. 1 is an old-fashioned shallow-bin type of storage having a capacity of 150,000 bbl. No. 2 is a reinforced-concrete structure with bins 50 ft. deep holding 100,000 bbl. of cement. This house is 100 ft. by 100 ft. in plan and has sixteen 20-ft. by 20-ft. side bins and one 60-ft. by 60-ft. center bin. The cement is drawn from No. 1 stock-house by transverse spiral conveyors in troughs set in the floor of the storage bins. Two longitudinal conveyors carry the cement to No. 1 pack-house, where it is elevated to the packing bins. Installed in this house are three 3-spout Bates packing machines, all discharging on a 24-in. belt-conveyor which takes the filled bags to the car-loading platform.

The cement from No. 2 stock-house is drawn off into 16-in. spiral conveyors located in five tunnels underneath the stock-house floor. These five conveyors are driven by a 10-hp. motor mounted on a truck, which can be moved from one conveyor to another at will. A 16-in. cross conveyor then carries the cement to an elevator and conveyor system, which puts it into the bins of pack-house No. 2. This house was laid out for four 4-spout Bates machines, but only two are installed. These machines are low-setting, no belt-conveyors being used, as the car-loading tracks are very close to the machines. The machines are 40 ft. apart, which allows two cars to be "spotted" at each machine. Very little truck packing is done at this plant. An adequate bag-cleaning and storage department is located between the two stock-houses.

Electric-Power Distribution.—All power for the operation of the plant is purchased from the Hydro Electric Power Commission of Ontario. The current is delivered to the plant at 12,000 v., 3-phase, 25-cycle, and is stepped down in the company substation to 2,200 v. or 440 v., 25-cycle as required in the different departments. Two 1,500-kv.-a., 12,000-to-400-v. transformers and one 1,500-kv.-a. 12,000-to-2,200-v. transformers are used for this purpose. One 750-kv.-a. and one 350-kv.-a. rotary condensers are used for power-factor correction, each driving a 125-kw. d.-c. 220-v. generator. These generators produce the d.-c. power required to operate the kiln department and crane motors.



The 412-ft. rotary kiln with ten cylindrical cooler units at the discharge end.

All secondary power cables are 3-wire lead-covered and are laid underground in fiber-lined concrete conduits from the substation to the distributing panels in the various departments. Totally-inclosed automatic oil-switch compensators, with extension trips where required, are used on all 440-v. circuits. Magnetic switches aer used on the small motors. Ellison totally-inclosed switch-gear is used on the 2,200-v. circuits.

In order to provide sufficient auxiliary a.-c. power to operate the slurry agitators in case of a failure of the main power supply, a 125-kv.-a. generator, which is belt-driven by a 120-hp. Vickers-Petter Diesel engine, was installed. This unit is located directly under the correcting tanks. A small gasoline-engine-driven compressor supplies the air required for starting the Diesel engine.

Equipment and Engineering.—The wash-mill, slurry agitators, raw-grinding mills, kiln, kiln auxiliaries and control system were furnished by F. L. Smidth & Co., most of the equipment being built in Canadian factories. The Dodge Mfg. Co. furnished the anti-friction belt-conveyor idlers and pulleys in the new rock-crushing department and all the conveyor belting was supplied by the Goodyear Rubber Co. of Canada. The kiln stack was erected by the Custodis Chimney Co.

Lime Code *(from page 21)*

provisions of this code within their respective districts and may make such investigations as may be necessary for that purpose.

All information necessary for any such investigation shall be reported to a confidential agency selected by the District Control Committee and shall be kept confidential except when a violation of this code is thereby disclosed.

Each District Control Committee may consider and prepare uniform merchandising plans to be recommended to the Trade Relations Committee containing such provisions as may be deemed necessary or proper to insure fair selling methods by the manufacturers in the district and to prevent unfair competitive practices, and to consider and prepare for recommendation to the Trade Relations Committee any system of standardization of products necessary or advisable to insure fair selling methods, and to advise with the Trade Relations Committee upon any other matter pertinent to the purposes or administration of this code.

Sec. 4. Amendments.—Such of the provisions of this code as are not required to be included therein by the National Industrial Recovery Act may, with the approval of the President, be modified or eliminated as changes in the circumstances or experience may indicate. It is contemplated that from time to time supplementary provisions to this code or additional codes will be submitted for the approval of the President to prevent unfair competition in price and other unfair and destructive competitive practices and to effectuate the other purposes and policies of Title I of the National Industrial Recovery Act consistent with the provisions thereof.

Sec. 5. Appeals.—(a) *Any interested party shall have the right of complaint to the appropriate District Control Committee and of a prompt hearing and decision thereon in respect of any decision, rule, regulation or course of action of such District Control Committee. Such complaint must be filed in writing with such District Control Committee within 30 days after receiving notice of such decision, rule, regulation or course of action. The decision of such District Control Committee may be appealed by any interested party to the Trade Relations Committee.*

(b) *Any interested party shall have the right of complaint to the Trade Relations Committee and of a prompt hearing and decision thereon in respect of any decision, rule, regulation or course of action of the Trade Relations Committee. Such complaint must be filed in writing with the Trade Relations Committee within a reasonable time after such decision, rule, regulation or course of action is issued or taken.*

(c) *Any interested party shall have the right of appeal to the Administrator, under such rules and regulations as he may prescribe, in respect of any decision, rule, regulation or course of action, issued or taken by the Trade Relations Committee.*

(d) *Any such complaint or controversy or any other question arising under this code may, however, be submitted by the interested parties to arbitration under the Rules of the American Arbitration Assn., and, in case of any submission to such arbitration, the decision of the arbitrators shall be final.*

Sec. 6.—This code and all the provisions thereof are expressly made subject to the right of the President, in accordance with the provision of Subsection (b) Sec. 10 of the National Industrial Recovery Act, from time to time to cancel or modify any order, approval, license, rule or regulation issued under Title I of said Act and specifically, but without limitation, to the right of the President to cancel or modify his approval of this Code or any conditions imposed by him upon his approval thereof.

Sec. 7.—Within each state, members of the trade/industry shall comply with any laws of such state imposing more stringent requirements, regulating the age of employees, wages, hours of work or health, fire or general working conditions, then under this code.

Sec. 8.—By assenting to this code, the members of the lime industry do not thereby consent to any modification thereof and they reserve the right to object individually or jointly to any such modification.

Sec. 9.—This code shall become effective on the tenth day after the date of its approval by the President.

SCHEDULE "A"

Lime Industry Districts

District 1.—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island and that portion of New York east of the 77th meridian.

District 2.—New Jersey, Delaware, Maryland and that portion of Pennsylvania east of the 77th meridian.

District 3.—West Virginia and that portion of New York and Pennsylvania west of the 77th meridian.

District 4.—Virginia, North Carolina and South Carolina.

District 5a.—The Ohio hydrated finishing-lime plants and factories located in the state of Ohio, composed of the following: Herzog Lime & Stone Co., Forest, O.; Kelley Island Lime & Transport Co., White Rock, Gibsonburg and Tiffin, O.; National Gypsum Co., Luckey, O.; National Lime & Stone Co., Carey, O.; National Mortar & Supply Co., Gibsonburg, O.; Ohio Hydrate & Supply Co., Woodville, O.; Washington Building Lime Co., Woodville, O.; Woodville Lime Products Co., Woodville, O.; United States Gypsum Co., Genoa, O.; Gibsonburg Lime Products Co., Gibsonburg, O.

District 5b.—State of Ohio, except the hydrated finishing-lime plants described in District 5a above.

District 6.—Michigan.

District 7.—Illinois, Indiana, and that portion of Missouri east of the 93rd meridian.

District 8.—Wisconsin.

District 9.—North Dakota, South Dakota, Minnesota and Iowa.

District 10 and 11.—Kentucky, Tennessee, Mississippi, Alabama, Georgia, Louisiana east of Mississippi River and Florida.

District 12.—Nebraska, Kansas, Oklahoma, Arkansas, Louisiana west of Mississippi River and that portion of Missouri west of the 93rd meridian.

District 13.—Texas.

District 14.—Washington, Oregon, Idaho, Montana and Wyoming.

District 15.—California, Nevada, Utah, Arizona, Colorado and New Mexico.

Some Notes on the Application of Kühl's "Correct" Lime-Content Formula

By ARTHUR J. POOL

Chief Chemist, Consolidated Cement Corp.

IN the March, 1933, issue of PIT AND QUARRY Dr. Hans Kühl presents, as a result of researches made by himself and associates, a formula by means of which the maximum lime content of Portland cement can be determined.

The quantity of lime as determined by Kühl's formula is called *standard lime*, and is numerically equal to $2.8SiO_2$ plus $1.1Al_2O_3$ plus $0.7Fe_2O_3$. For any given Portland cement what is designated as the *Lime Standard (L. St.)* is derived by dividing 100 times the actual percentage of lime present in the cement by the "standard lime" according to the formula:

$$\text{L. St.} = \frac{\text{Actual Lime}}{\text{Standard Lime}} = \frac{100CaO}{2.8SiO_2 + 1.1Al_2O_3 + 0.7Fe_2O_3} = 100.$$

Kühl states that "every cement plant burning a well-prepared raw meal in the modern kiln can attain lime standard 100. When this formula is applied to a clinker analysis and a lime standard of 100 is obtained, such clinker according to Kühl, contains just the correct amount of lime for combination with the SiO_2, Al_2O_3, and Fe_2O_3. Lime standard 100 then represents the ideal composition, and the chemist, provided he has confidence in the reliability of the formula, will strive to attain this ideal.

It is not the purpose of this article to discuss the merits or demerits of Kühl's formula, but to present what I believe to be the proper application of it. In applying Kühl's formula either to under-limed or over-limed clinker analyses I have reasons to believe that unjust criticism of the formula may result. This is because a direct application of the formula gives, in the case of under-limed clinker, a figure for maximum lime that is too high, and for over-limed clinker it gives a figure for maximum lime that is too low. This can be illustrated by applying the formula to the following analyses:

	Under-limed Clinker	Over-limed Clinker
SiO_2	23.0	17.9
Fe_2O_3	3.1	3.3
Al_2O_3	5.8	8.6
CaO	64.4	69.3
Other constituents	3.7	0.9

Direct application of the formula to the under-limed clinker gives 73 per cent. as the maximum lime or, rather, what appears to be the maximum lime; and for the over-limed clinker the formula gives 62 per cent. as the apparent maximum lime.

Obviously neither figure indicates the maximum lime. For if we substitute in the under-limed analysis the figure 73 as the percentage of lime instead of 64.4 we obtain 108.6 per cent. total constituents. And, if in the over-limed analysis the figure 62 is substituted for 69.3 as the percentage of lime we obtain 92.7 per cent. total constituents.

Naturally, the chemist wishes to adjust the lime content of his clinker so as to approach as closely as possible to lime standard 100, but the direct application of Kühl's formula does not tell him exactly what percentage of lime is necessary.

The crux of the matter is that as the percentage of lime alone is increased the percentages of the constituents other than lime are *decreased* proportionately; and as the percentage of lime alone is decreased the percentages of constituents other than lime are *increased* proportionately. In short, the percentages of constituents other than lime are inversely proportional to the percentage of lime.

Application to Low-limed Clinker.—To illustrate, suppose we start with 100 parts of the under-limed clinker and incorporate increments of lime. Now with each increment of lime the percentage of lime and the total number of parts increase, but the percentages of constituents other than lime decrease. Finally, the point of maximum lime will be reached and the application of Kühl's formula will give lime standard 100.

In the case of the under-limed clinker the point of maximum lime will be reached when 8.6 parts of lime have been incorporated, giving a total of 108.6 parts. Now in the 108.6 parts there are 73 parts of lime, but analyses are based on 100 parts. Therefore, the percentage composition of the new clinker is calculated by multiplying the number of parts of each constituent in the total 108.6 parts by 100/108.6, obtaining:

	Per Cent.
SiO_2	21.2
Fe_2O_3	2.9
Al_2O_3	5.3
CaO	67.2
Other Constituents	3.4

Applying Kühl's formula to this analysis:

$$\frac{100 \times \text{Actual Lime}}{\text{Standard Lime}} = \frac{100 \times 67.2}{(2.8 \times 21.2) + (1.1 \times 5.3) + (0.7 \times 2.9)} = 100.$$

(Continued on page 38)

Supplement to Cement Fair-Competition Code Is Lengthy Document

Prescribes Detailed Rules for Selling Methods and Other Competitive Practices

THE Code of Fair Competition for the cement industry as submitted to the National Recovery Administration by the Cement Institute contained a lengthy supplement which sets out in detail the practices that are considered practical. Owing to the lack of space this was not published in the October issue of PIT AND QUARRY, which contained the principal provisions of the code. It is published herewith and is to be understood as being a continuation of the main portion of the code as given on pages 22 to 24 and 38 and 39 of the October issue.

SUPPLEMENT TO BASIC CODE OF FAIR COMPETITION OF THE PORTLAND-CEMENT INDUSTRY

GENERAL STATEMENT

This Supplement to the Basic Code of Fair Competition of the Portland-cement industry, and a part thereof, and filed therewith, with the N. R. A. is a compendium of fair trade practices pertinent and necessary to protect and promote good understanding within the industry, and lends itself to the effectuation of the policy of Title I of the National Industrial Recovery Act.

Most of the trade practices described herein have long been observed by the industry and represent the combined experience and best thought of those who have for many years been engaged in the production, sale and distribution of Portland cement.

The contents of this supplement, when approved by the National Recovery Administration, become a part of the Basic Code of Fair Competition binding all members of the industry to observe its provisions in the conduct of their business.

These trade practices are set forth as follows:

ARTICLE I

Standardization of Product

1. For the protection of the public generally, all Portland cements marketed by the plants of this industry shall comply with the standard specifications for Portland cement of the American Society for Testing Materials and the American Standards Assn. and/or the Federal Specification Board. Manufacturers may also sell cements under modified Portland-cement specifications that are designed to meet special and unusual conditions not adequately, or properly, covered by the specifications referred to above; provided that the price at which such modified Portland cements are sold shall take into account the increased or diminished costs thereof.

2. Every manufacturer shall guarantee his products to comply with all the conditions of the specifications under which they are sold, but manufacturers shall not be responsible for the improper use of cements and therefore shall not guarantee finished work, nor shall the manufacturers be responsible for condition of product after delivery.

3. No manufacturer shall pay or absorb, directly or indirectly, any charges incident to inspection or tests made by or on behalf of the purchaser to determine compliance with the specifications.

ARTICLE II

Terms and Conditions of Sale

1. All future-sales orders and future-sales contracts for the sale of Portland cement shall contain a definite statement of price, quantities, terms of payment, time and place of delivery and all other terms of sale necessary to form a complete and unambiguous contract; further that all agreements so entered into shall be performed in letter and in spirit.

2. No manufacturer shall substitute for a contract or purchase order already executed a new contract or purchase order for the same requirements at a lower price or on more favorable terms to the purchaser than are contained in the original contract or purchase order.

3. Cement purchased for delivery beyond 15 days from date of purchase is sold for what is usually termed "specific work," the purpose being to give price protection to a purchaser who is obligated to furnish cement for a definite project at a fixed price.

There are two forms of coverage used in this field:

(1) The future-sales order, marked Exhibit C, used primarily by those buyers who purchase for resale and obligate themselves at a fixed price for future delivery. In so far as it is not always possible to accurately check the cement requirements of an operation in its early stages, this form makes it possible for the retail dealer to handle his deliveries for this operation on the same basis that he handles his day-by-day (current) business. At the same time it grants the dealer full protection by allowing him to enter into a firm contract with the manufacturer, protecting him at a fixed price in event of a market advance for the amount of cement yet required to complete the various operations he has under way.

(2) The future specific-sales contract, marked Exhibit D. This is a definite contract binding on both parties, which is used to cover those operations which are sold to buyers not engaged in the resale of cement. Work usually covered by this type of purchaser is work of a public nature in which quantities are readily available through public engineering bodies.

This form of contract is also used with those buyers who purchase for resale but whose operations are also of such a nature that the quantities involved may be accurately checked.

4. Attached hereto and marked Exhibits C and D are forms of future specific-sales orders and contracts, the provisions, terms and conditions of which have been agreed to in substance as representing the best practices within the industry and adopted as a part of this code.

5. Terms of payment:

A cash discount of 10 c. per bbl. may be deducted from invoices paid in full within 15 days from date of issue.

Invoices not discounted are payable net 30 days from date of issue.

(a) Where large purchases involve frequent shipments, a plan of semi-monthly remittance, based on a 15-day average, may be used.

Example: All invoices date from 1st day of month to 15th day of month inclusive to be paid by the 22d of that month; and all invoices dated 16th to 31st inclusive to be paid by the 7th day of the following month.

(b) Cash discount will not be allowed if remittance is forwarded after the expiration of the 15-day period or semi-monthly period; or if deduction is made in the remittance for cloth sacks to be returned or in transit and not yet credited; or if the remittance consists in whole or in part of notes, trade acceptances, script, warrants (whether interest-bearing or not), or any medium other than cash or bankable check for the full amount of the invoices upon which cash discount is deducted.

(c) The post-mark date at point of mailing will determine the date of remittance. Fair competition requires that terms of payment be fully observed and that no unearned discounts be allowed.

6. Package charges and allowances:

(a) When cement is shipped in cloth or paper sacks, the price will include the manufacturer's published deposit or leasing charges for cloth sacks or the selling charge for paper sacks and such charges will be required to be paid at the same time as the cement.

(b) When used cloth sacks are returned empty to the manufacturer, the credit or allowance will at all times be in accordance with the manufacturer's published terms and conditions of sale.

7. *Invoices.*—Invoices shall be dated as of the date of shipment (provided, where special and unusual conditions prevail, the members in the district or districts concerned may, subject to approval of the committee, change this provision to conform thereto), and shall contain full information as to price, quantity, kind of package, terms of payment, place of deliveries, routing, amount of freight allowed and any other data necessary to fully show all conditions entering into the sale. Fair competition requires that all the conditions stated in the invoice be fully observed. Any deviation or concessions from these conditions is an unfair practice.

ARTICLE III

Method of Selling and Marketing Cement

The provisions of this article represent fair and accepted methods of selling and marketing cement.

There are, however, in certain sections of the country, customs which are at variance with some of these provisions, but exceptions to or modifications of any of these provisions are not authorized, except with the authority and approval of the Board of Trustees being first had and obtained and the Board of Trustees shall have the authority to authorize and approve such exceptions or modifications as it may see fit for all companies in the marketing area affected.

1. Except as otherwise specified, Portland cement shall be marketed in each community through the building-material dealers, regularly serving such community. This applies to all classes of buyers except as in Par. 2. Importers, brokers and so-called distributors shall be considered as competitors.

2. The following classes of buyers shall be sold direct by a manufacturer and at the same price and under the same terms and conditions of sale as to dealers, except as provided in Par. 6.

United States Government.

State Government, counties and parishes when properly authorized to purchase cement for public improvements or maintenance.

Contractors doing any of the foregoing classes of work, except where such work is located entirely within cities or villages.

Railroads filing tariffs with state or interstate commissions, including terminal railroads and contractors doing work for such railroads.

Owners or contractors buying for power-development, flood-control and water-supply projects not requiring dealer service.

Concrete-product manufacturers, including block, tile, roofing, pipe, piling and all other precast concrete units, when for their own manufacturing operations but not for resale.

3. *Definition of a Dealer.*—A cement dealer in the industry is one who has an established place of business where he is regularly engaged in selling Portland cement and other building materials to the public, with facilities to serve the retail trade in a given territory, and able and willing to perform all functions devolving upon him in securing, performing and protecting contracts for the delivery of Portland cement for specific work on his account.

The dealer's compensation shall come from the sale of his materials to his customer, based on services rendered and the cement manufacturer shall not pay a dealer commissions or other remuneration.

4. Cement is marketed on the basis of a barrel, weighing 376 lb. net; and is delivered in the following manner:

(a) In cloth or paper sacks, 4 sacks of 94 lb. net constitute a barrel; or,

(b) In bulk in railroad equipment, invoiced and collected on the barrel basis computed on weights on track scales at the plants or nearest point of origin.

5. *The sale of cement* is made either on current or market orders for delivery within 15 days, or on orders or contracts for future delivery beyond 15 days.

A current or market order is a sale at the manufacturer's published price on the date the order is taken, and such order may be placed by any purchaser or user for either immediate shipment or not more than 15 days after order is placed. Orders entered for 15-day shipments are subject to shipment on the 15th day without notice to the purchaser. Quotations on current orders shall be for immediate acceptance.

Cement purchased for delivery beyond 15 days from date of purchase is sold for what is usually termed "specific work," the purpose being to give price protection to a purchaser who has obligated himself to furnish cement for a definite construction project at a fixed price.

6. *Application of Exhibits "C" and "D."*—The practice of booking either specific work orders or periodic requirement contracts from various groups of purchasers shall be as follows:

(a) *United States Government and States.*—Sell on requirement contracts—period of delivery up to 1 yr.—when contract is direct with the manufacturer, and for calendar quarter if contract is through a dealer.

(b) *Counties, Parishes and Cities.*—Sell on calendar quarterly-requirement contracts.

(c) *Railroads.*—Sell on calendar quarterly basis for general requirements. Specific jobs requiring extended delivery may be sold under the plan outlined below for specific-work contracts, provided the jobs are covered by appropriations, plans prepared and it is possible to definitely check the job for location and quantity. Contracts for such specific job will be limited to shipment for such work only and will be closed for a period of not to exceed 1 yr. from date of contract. Cement under such specific-job contracts shall not be shipped to any town other than that provided in the contract nor can it be diverted for use in general repair or maintenance work.

(d) *Owners and Industrials.*—This title includes all owners of industrial projects, such as coal companies, manufacturing companies, street railways, packing houses, stock-yards, cemeteries, light-and-power companies, and all public utilities except railroads having published tariffs and recognized by public-service commissions as common carriers.

Sell for 15-day shipment only on current or market orders; and when work is done by the owners, specific contracts will not be made; but when an industrial awards a specific job to a contractor and the contractor buys the cement requirements, specific-work contract will be closed provided it comes within the requirements as to definiteness, checking, etc.

(e) *Conduit Construction or Repair Work* by public utilities is not a specific job and will not be sold for extended delivery. Sales will be made for 15-day shipment only on current or market orders.

(f) *Speculative Residential Work.*—Sell for current delivery only; no extended protection. Any project involving more than one residence for one owner constitutes a speculative operation.

(g) *Products Manufacturers.*

(1) Manufacturers of blocks, tile, roofing, and all manufacturers not included in (2) below: Sell on calendar quarterly contracts.

(2) Pipe manufacturers and concrete-pile manufacturers: For specific jobs which can be definitely checked for quantity and location, sales may be made on specific-contract basis as provided below. In general such specific contracts will be confined to public work awarded by contract where the cement requirements can be accurately figured.

An order held by a pipe manufacturer for the year's requirements of a city, county, state, industrial or contractor is not a specific job. Such orders as well as general requirements of the plant will be covered only on calendar quarterly contracts.

(h) *Commercial Concrete-Mixing Plants.*—Shall be sold for 15-day delivery or for specific-job requirement as herein provided; but shall not be sold for general or periodic requirements.

7. *Time of Closing Calendar Requirement Contracts.*—Contracts for any quarter will be quoted or closed not earlier than the first day of the last month of the preceding quarter.

Note: The basis of a contract (except on sales direct from manufacturer to users) will be a binding order placed by the dealer with the manufacturer. An order placed by a contractor with a manufacturer, with the understanding that a dealer will be selected later, is not sufficient. The order must be definitely placed with a dealer.

8. *Time and Manner of Closing Specific-Work Orders.*—When a contractor has placed an order with a building-material dealer for a specific-work project, the manufacturer will book from the dealer a purchase order for the required amount of cement to be invoiced at the manufacturer's market price at time of shipments. This order will be binding on both parties. The parties will agree in this order that if the manufacturer's price should advance, a specific-work contract will be entered into at the price prevailing prior to such advance, for the quantity of cement then required to complete the project. The dealer will furnish the manufacturer, as the basis for such contract, his record of the amount of cement delivered to the contractor prior to the advance in price, together with a verified written estimate from a responsible representative of the contractor of the amount of cement still required to complete the work.

Specific-work orders at prices prior to an advance in prices, but closed during the period immediately following an advance, as described in Par. 9, will be covered immediately by specific-work contracts, but such contracts will be supported by the dealer's record of prior deliveries and the contractor's written estimate of requirements as above stated.

9. *Manner of Procedure on Price Changes.*

(a) Any manufacturer initiating a price decline approved by the committee shall do so publicly and make it effective immediately.

Those following shall make their prices effective as of corresponding date. Such declines shall be retroactive on all shipments made within 5 days before effective date.

(b) Any manufacturer initiating a price advance approved by the committee shall give 5 days' notice thereof to the trade. Competitors meeting such an advance shall make their quotations correspond as to effective date.

(c) During the 5-day-notice period current or market orders may be booked at the prior price for shipment not more than 15 days from the date the advance becomes effective.

(d) Each specific-work quotation shall contain a provision permitting withdrawal on 5 days' notice.

(e) After an advance in price all outstanding quotations on work for which bids have been opened, which quotations extend longer than 15 days from the effective date of the new price, shall be withdrawn or revised to expire on the 15th day.

(f) All quotations at the prior price, made during the 5-day-notice period, will be confined to jobs on which bids are to be opened prior to 10 days from effective date of new price. Such quotations may be closed by contract not later than 15 days from effective date of new price.

(g) All quotations outstanding on jobs on which bids are to be opened later than 10 days after effective date of new price will be withdrawn, and any quotations made on such jobs during the 5-day-notice period will be at the new price.

Illustration: New prices are quoted Feb. 1 to become effective Feb. 6. All quotations on jobs bid Feb. 16 or earlier will be limited to Feb. 21, by which date buyer must place a definite binding contract. All jobs to be bid Feb. 17 or later will be quoted at new price.

10. *Diversion or Reconsignment of Shipments.*—No manufacturer shall divert or permit purchasers or users of cement to divert shipments of cement from one destination to another destination, the result of which will enable the purchaser or user to secure cement at less than the manufacturer's market price at the point of final destination.

11. *Method of Compensation or Remuneration to Salesmen.*—Salesmen shall be full-time employees, not compensated on a commission basis but on a salary basis only.

Article IV

Unfair Trade Practices in Marketing Cement

The following practices, undertaken for the purpose, or with the effect, directly or indirectly, of furthering the sale or use of a particular brand of cement, are specifically designated as unfair and will not be followed.

1. Except with permission of the committee (and such permission when given shall apply to all companies in the marketing area affected), the purchase, by any manufacturer, of bonds, or other securities, issued for the financing of construction work, either in the name of the manufacturer, its subsidiaries, or of individuals, or officers, connected therewith, or the acceptance of such bonds, or other securities, in payment, wholly or in part, for cement. Or the advance, loan or payment of any moneys by a manufacturer for the purpose of inducing the purchase of cement. To assume cost of bidders' bonds or to endorse or guarantee or in any way relieve bidders of the responsibility for or the expense of providing such bonds.

2. The purchase by any manufacturer of fuel, or other supplies, either in the name of the company, or its subsidiaries, or of individuals, or officers connected therewith, at prices above the fair market price of such commodities at the time of purchase.

3. Lavish, excessive or undignified entertainment of purchasers or users of cement, or others connected therewith.

4. Donating funds, or providing banquets or other similar lavish entertainments for purchasers or users, or associations thereof.

5. Giving, or offering to give, premiums, personal gifts, gifts of cement, or gifts of any other commodity of substantial value to purchasers or users of cement.

6. The payment [of], or offer to pay, directly or indirectly, any advertising expenses of purchasers or users of cement.

7. The prepayment of railroad-freight charges on shipments consigned to other than the cement manufacturer itself, except in the case of freight charges to railroad stations to which railroad regulations require prepayment from any shipping point, or the payment of railroad demurrage charges by any manufacturer on such shipments. The only exception to this rule relating to prepayment of freight charges shall be shipments purchased directly by and consigned to departments of the United States or state governments.

8. The making [of], causing or permitting to be made, or published, any false, untrue or misleading statement by way of advertisement or otherwise concerning grade, quality, character, nature, origin, manufacture or preparation of products.

9. Willfully diverting or permitting to be diverted to other uses cement shipped for a specific-work project, or willfully shipping on a specific-work order or contract an amount of cement in excess of the actual needs of such work.

10. Services to purchasers or users are proper under fair competition, if confined within the limits of advice or consultation. Services of a definite, physical nature, resulting in monetary benefit of purchasers and users are discriminatory and not in accord with the standards of fair competition.

11. The sale by any manufacturer or his employees of any commodity at a discriminatory price.

ARTICLE V

Unfair Competition

Fair competition requires fair standards in the attitude of each member of an industry toward his competitor, to the end that competition may be honest, open and fair. The following practices are not in accord with this standard and will not be used:

1. Willful interference, by any means or device whatever, with any existing future-sales order or future-sales contract between a manufacturer and his customer, with the purpose, or effect, of inducing or causing a breach of such contract.

2. Defamation or disparagement of a competitor by words or acts which untruthfully call in question his business integrity, his ability to perform his contracts, his credit standing, or the grade, quality, count or weight of his product.

3. Enticement of the employees of a competitor with the intent or effect of interfering with the conduct of the business of such competitor.

4. Every manufacturer shall be responsible for the prevention of any agency of transportation, including owners or operators of boats, from making any payment or allowance, by rebate or otherwise for the purpose or with the effect of inducing or influencing the sale or purchase of cement, and failure to observe this provision shall be deemed unfair competition.

EXHIBIT C

(Specific-sales order)

To .....
(Name and address of cement company)
We have sold to.....
Contractor.....Barrels of (Brand).....
Portland cement for.....of his
(fraction or all)
requirements on the following specific work awarded him:)
(Character, description and location of work, and name of owner)

We hereby place with you our order for the above quantity of (Brand).....Portland cement to be packed in ..... (sacks), for use on the above work, at your prevailing market price at time of shipment, subject to the conditions stated on both sides hereof.

We will desire delivery made, as the work requires, upon our instructions in car-load lots, f. o. b. cars..... deliveries to be complete prior to.....

It is expressly understood and agreed:

1. That if you advance your market price prior to the completion of shipments on this order, you will, within 10 days of the effective date of such advance, enter into your standard form of specific-work contract with us, at the price prior to such advance, for the quantity of cement that may at that date be required for the completion of the work covered by this order.

2. That, as a basis for such specific-work contract, we will supply you with our record of cement delivered to the contractor prior to the time of your advance in price, together with a written estimate from the contractor, or a responsible employee of the contractor, of the quantity of cement then required to complete the work.

Signed .....
Date .....

Accepted:
.....
(Cement company)
.....
(Officer)
Date .....

Terms of Payment.—On approved credit net cash 30 days from date of invoice, or 10 c. per bbl. discount for cash in 15 days from date of invoice.

If at any time the financial responsibility of buyer becomes impaired or unsatisfactory to seller, it reserves the right to require payments in advance or satisfactory security or guarantee that invoices will be promptly paid when due.

If buyer fails to comply with terms of payment, or with any of the other terms of sale, seller reserves the right to cancel unfilled portion of this order, without notice, buyer remaining liable for all unpaid accounts. No waiver of such right shall be implied from any failure by seller to exercise the same.

Package.—Cloth sacks bearing seller brands, in which cement herein contracted for is packed, are the property of seller and are for a period of 90 days from the delivery by seller of the said cement leased by it to buyer at a charge of 10 c. each, which charge is included in price for cement packed in cloth sacks and which charge buyer agrees to pay at same time and on same terms as payment for cement is made.

Buyer agrees within 90 days of delivery of the cement to deliver to seller (the owner), at its nearest plant, freight charges collect, as provided by railroad classifications and tariffs, properly bundled and so marked as to insure complete identification, the cloth sacks bearing seller's brands, in which the said cement is packed, and seller agrees to refund to buyer 10 c. for each said cloth sack so delivered in good condition, subject to seller's count and inspection, and to assume freight charges thereon. If for any reason freight charges (per railroad tariffs) are prepaid, they will be refunded by seller upon presentation of railroad company's receipted freight bill or bill of lading.

For useless cloth sacks which have been wet no refund will be made. Cloth sacks bearing other than seller's brands will be held by seller for 30 days subject to buyer's order.

In the event that any of the said empty cloth sacks bearing seller's brands are sold or otherwise disposed of to any person other than seller (the owner), buyer agrees to pay seller, as liquidated damages, 10 c. for each cloth sack so sold or disposed of.

If during the life of this order seller shall change its present charge for the lease of cloth sacks, or the liquidated damages, or both, it is expressly agreed that the said amount or amounts in the preceding paragraphs shall be changed accordingly, and the gross price specified herein for cement packed in cloth sacks shall be changed in accordance with the change in charge for lease of cloth sacks.

Price on cement packed in paper bags includes the paper bags, which are not returnable. Shipments in paper bags are made at buyer's risk of breakage and resultant loss of cement.

[If cement company requires a deposit for cloth sacks, instead of leasing them, the following clauses are suggested:

Package.—The cloth sacks, bearing seller's brand, containing the cement are not sold, but remain the property of seller. Buyer agrees to return said cloth sacks, properly bundled and marked so as to insure complete identification, to seller's nearest mill, within 90 days from the date shipment of cement has been made.

Seller agrees to refund to buyer the deposit of 10 c. for each cloth sack so returned. This deposit has been included in the price herein stated and buyer agrees to include it when payment for the cement is made.

It is, however, expressly understood that such cloth sacks must be delivered to seller's mill in good condition and will be subject to mill count and inspection, and that no refund will be made for useless cloth sacks nor for cloth sacks not of seller's brand. Such cloth sacks, if received, will be held by seller for 30 days subject to buyer's order and risk.

Seller agrees to pay carrier's freight charges on returned empty cloth sacks of seller's brand after delivery to its nearest mill or to refund buyer for freight charges prepaid on such shipments upon presentation of original bill of lading properly executed or original receipted freight bill.

If seller shall change its present deposit required for cloth sacks, it is expressly agreed that the said amounts in the preceding paragraphs shall be changed accordingly and the gross price specified herein for cement packed in cloth sacks shall be changed in accordance with the change of deposit required.

Price on cement packed in paper bags includes the paper bags which are not returnable. Shipments in paper bags are made at buyer's risk of breakage and resultant loss of cement.]

Claims.—Claims for loss or damage will not be considered unless supported by seal record and railroad agent's acknowledgment on freight bill. Freight overcharge claims must be accompanied by original receipted freight bill.

Time of Delivery.—Buyer shall give seller shipping instructions in writing a reasonable time before shipments are to be made. If buyer fails to order shipment within the time specified, seller shall have the right to extend the time for delivery of such cement, but shall not be obligated to do so, except at its option.

Seller reserves the right to select the route by which shipments shall be forwarded. Freight charges, per tariff applying from shipping point to place of delivery above specified, shall be paid by buyer for account of seller.

Seller shall not be liable to buyer for any delays in manufacturing, shipping or delivering said cement, caused by fire, strikes, lock-outs, differences with workmen, accidents, war, insurrection, inability to secure cars, coal or other material, governmental interference or regulation, delays in transportation, or contingencies beyond seller's control; and during the time of such delays seller shall have the right to prorate among its various customers such cement as it may be able to manufacture and ship.

(Continued on page 38)

Ready-Mixed-Concrete Industry Offers Competition Code to N.R.A.

Transit-Mixer Manufacturers Protest Rule Preventing Movement of Plants

FINAL revisions, including amendments to the price-publication section and minor changes in the hours of labor and rates of pay division, in the code of fair competition for the ready-mixed-concrete industry were presented to administration representatives at the formal N. R. A. hearing of the code in Washington Oct. 26. Changes and amendments will be reviewed by the government advisory board, meeting with the code committee of the industry, before the final draft of the proposed code is presented to the President for signature.

H. F. Thomson of the General Materials Co. of St. Louis, president of the National Ready Mixed Concrete Assn., whose membership represents 60 per cent. of the plants in the industry, presented the code at the hearing, which was presided over by Ralph Fogg, assistant deputy administrator of the N. R. A. In his opening statement Mr. Thomson told something of the history of the ready-mixed-concrete industry and of its rapid growth from 25 plants in 1925 to more than 300 at the present time. He also explained some of the competitive and other problems peculiar to the industry.

"A degree of flexibility in the hours of operation in the industry is necessary in order that the mixed-concrete manufacturers may supply the product to contractors when and as it is needed," Mr. Thomson explained. "Mixed concrete is in fact a perishable product and must be delivered to contractors within an hour after it is made. On this service feature depend the profits of the industry."

One of the difficulties encountered in recent years has been the setting up of small units in localities using little equipment and selling at reduced prices, thus seriously embarrassing the established industry with its relatively-large amount of equipment by breaking down the price structure. These small units were described by Mr. Thomson as chiselers in the industry.

The proposed code provides for a maximum 40-hr. week averaged over a 6-months' period for plant employees; 48 hr. averaged over a 3-months' period for truck drivers and dispatchers; and 44 hr. averaged over a 6-months' period for clerical workers. Watchmen would work 60 hr. under the provisions of the code.

For a determination of the minimum rates of pay the country has been divided into five geographic regions with the minimum ranging from 30 c. an hr. in nine southern states to 50 c. an hr. in New York City, with a differential under these rates of 5 c. per hr. in cities under 500,000 and 10 c. in communities of less than 75,000 population.

Labor representatives headed by Fred A. Tobin, of the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America, and John W. Garvey, of the Hod Carriers' Union of America, vigorously protested the labor provisions of the code. In his brief filed with the advisory board Mr. Tobin asked specifically that truck drivers be classed as skilled laborers, and objected to the minimum rates of pay in view of the rising costs of living. He proposed an amendment giving labor representation on the code authority and any committees which may be set up, with a right to make recommendations to the code authority and the administrator on problems relating to labor.

Mr. Garvey filed a brief asking that the maximum work hours be reduced to 30, with 36 allowed in emergencies, and that the minimum rate of pay be increased to 62½ c. an hr. irrespective of geographic divisions. The requests of the labor representatives will be reviewed by M. J. Colleron, government labor advisor in coöperation with the code committee of the industry.

On behalf of the code committee Mr. Thomson proposed an amendment to the article on marketing practices establishing the open-price policy and declaring it an unfair method of competition for any manufacturer within a given area to sell below published prices covering the area. The code committee is composed of J. E. Burke of J. K. Davison & Bro., Pittsburgh, Pa.; Charles P. Maloney, Maloney Concrete Co., Washington, D. C.; Arthur C. Avril, Avril Tru-Batch Concrete, Inc., Cincinnati, O.; Anthony G. Gull, Transit Mix Corp., New York, N. Y.; H. F. Thomson, General Materials Co., St. Louis, Mo.; V. P. Ahearn and Stanton Walker of the National Ready Mix Concrete Assn., of Washington, D. C.

Richard J. Maloney, representing all the ready-mixed-concrete plants in New York City, requested a formal ruling from the legal division of the N. R. A. as to whether six companies in New York, who are already conforming to the Building Supply code, may continue to do so or must come in under the ready-mixed-concrete code. He said his group felt that the builders' supply code is broad enough to cover them. Mr. Maloney said he sought a formal ruling in order that his group may know just what to do. Deputy Administrator Fogg explained that this question was already under consideration by the legal division and that a solution would be offered in a short time.

W. B. Henderson, representative of the Concrete Mixer Institute, filed formal protest to sections of the code which provide that notice must be given to the code committee in each area before any pro-

ductive capacity may be established, operations increased, or facilities moved from one marketing area into another. Mr. Henderson stated that he believed this was a discrimination against the truck-mixer manufacturers and would tend to restrict this industry. This in turn, he said, would tend to defeat the purposes of the National Industrial Recovery Act by producing unemployment in plants producing such equipment. He urged that this provision be so amended as to eliminate this danger.

Deputy Fogg asked that code committee meet with him and the several N. R. A. advisors at the adjournment of the hearing with a view to expediting the revision of code as much as possible. He said there was no attempt to "railroad" the code through, but he was desirous of completing it at the earliest possible time. Arrangements were made for the representatives of the industry to meet with W. T. Chevalier, industrial advisor, Miss Bernice Lotwin, legal advisor, Karl Hauck, consumer advisor, and Spencer Reed of the research and planning division.

Amendments to the code which were submitted by the members of the industry were decided upon at a meeting of the code committee and the National Ready Mixed Concrete Assn. in Washington, Oct. 25. Those present at this meeting included V. P. Ahearn, Stanton Walker, J. E. Burke, Anthony G. Gull, A. Johnson, Charles P. Maloney, Richard J. Maloney, Frank H. Morse, Joseph J. Ryan, E. S. Simpson, H. F. Thomson, Arthur C. Avril, Charles Warner, and R. Brooks.

Cement Code (from page 36)

Specifications.—The cement shipped under this order shall conform to the present standard specifications for Portland cement of the American Society for Testing Materials and the American Standards Assn. and/or the Federal Specification Board, and no other warranty is made in respect thereof. Seller having no control over the use of cement will not, therefore, guarantee finished work in which it is used, nor shall the seller be responsible for the condition of cement after delivery to buyer. Any charges incident to inspection or tests made by or on behalf of buyer to determine compliance with specifications shall be paid by buyer.

Seller's prevailing market price may be advanced by the amount of any increase in freight rates and/or any additional government tax on freight and/or the amount of any tax on sales or contracts of sale effective after the date hereof without imposing on buyer the obligation to enter into seller's standard form of specific-work contract, as provided in Par. 1 on the front hereof.

Lime Content (from page 33)

Thus we see that the lime in this particular clinker must be increased to 67.2 (not 73) per cent. in order to obtain lime standard 100. The original clinker contained 95.8 per cent. of the maximum lime.

Application to Over-limed Clinker. — When Kühl's formula is applied directly to the analysis of the over-limed clinker, which is that of a high-early-strength cement, we obtain 62 per cent. as the maximum lime, but we obtain also only 92.7 per cent. total constituents.

Starting, as in the preceding example, with 100 parts of the clinker, we find it necessary to reduce the number of parts of lime in order to give lime standard 100. The point of maximum lime for this clinker is reached when 7.3 parts of lime have been deducted, leaving a total of 92.7 parts. But, as the basis of analysis is 100 parts, the percentage composition of the new clinker is calculated by multiplying the number of parts of each constituent in the total of 92.7 parts by 100/92.7, obtaining:

	Per Cent.
SiO_2	19.3
Fe_2O_3	3.6
Al_2O_3	9.3
CaO	66.9
Other constituents	1.0

Application of the formula to this analysis gives lime standard 100. Thus we find that the lime in this particular clinker must be reduced from 69.3 per cent. to 66.9 (not 62) per cent. in order to obtain lime standard 100. Accordingly, the original clinker containing 69.3 per cent. lime, if perfectly burned, should contain theoretically a little less than 3.6 per cent. of uncombined lime. *An actual determination of uncombined lime in this clinker gave 3.33 per cent.*, which checks beautifully with the theoretical result.

Using the foregoing method of application the chemist can readily calculate from his clinker analysis the extent of change necessary in the lime content, provided the change in the amount of lime is accomplished by the use of a high-grade calcareous material. Where the calcareous material is low-grade, more nearly accurate calculations can be obtained by taking into consideration the amounts of acidic constituents contained therein. However, inasmuch as neglect to consider the relatively-small amounts of acidic constituents leads to a lower actual lime value, and inasmuch as it is hardly probable that in the manufacture of ordinary Portland cement lime standard 100 will be reached in actual practice anyway, this refinement probably can be dispensed with.

Although in actual practice under present conditions it may not be practicable to attain lime standard 100, this circumstance does not render Kühl's formula less valuable. Lime standard 100 becomes, as it were, a mark at which to shoot, and each chemist can ascertain for himself how closely he can come to that mark.

July Canadian Cement Sales

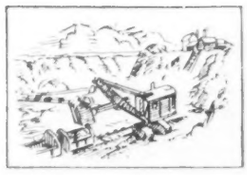
Sales of Portland cement in Canada during the month of July amounted to 414,827 bbl., as compared with 401,060 bbl. in the previous month. In the corresponding month of last year, sales totaled 460,170 bbl., while in June of 1932 they aggregated 570,618 bbl.

Total sales for the first seven months of the current year aggregated 1,503,364 bbl., as compared with 2,782,574 bbl. in the same period of 1932.

MEN OF THE INDUSTRY

JOHN PRINCE

JOHN PRINCE, president of the Stewart Sand & Material Co., Kansas City, Mo., after graduating from Cornell University in engineering in 1899 immediately began his long connection with the production of building materials. He began as assistant superintendent of the Glens Falls Portland Cement Co. and up to 1907 was engaged in the operation and construction of cement plants. He then engaged in engineering and contracting in Kansas City specializing in cement and aggregate plant construction. In 1919 Mr. Prince became president of the Stewart Sand Co. which later became the Stewart Sand & Material Co. Mr. Prince has been active in the affairs of various trade associations for many years and was for two years president of the National Sand & Gravel Assn.



Personal Mention

Fred E. Wolf has been appointed by the Pangborn Corp., Hagerstown, Md., as sales engineer for the New England territory. His office is at No. 19 Orchard Terrace, Arlington, Boston, Mass. **Ralph M. Trent** has been appointed sales engineer for the Pittsburgh territory and is located in the Chamber of Commerce Bldg., Pittsburgh, Pa.

W. K. Leach, formerly with the General Alloys Co., has been appointed general manager of the alloys division of the American Manganese Steel Co. He is located at the company's plant at St. Louis, Mo.

Major John C. Shumberger, comptroller of the Lehigh Portland Cement Co., Allentown, Pa., was elected first vice president of the Controllers Institute of America at the second annual meeting of that organization recently held in New York City.

Wm. E. Sayer, Jr., associated with the sales department of the Bloomington Limestone Co., Bloomington, Ind., for the past five years, was appointed adjutant of the Indiana department of the American Legion at a meeting of the department executive committee in Indianapolis on Oct. 15.

F. E. Weldon has been appointed resident superintendent of the Canadian Silica Products Co. quarry and plant at Lac Remi, Quebec.

Donald J. Reese has been appointed manager of the foundry equipment division of the Whiting Corp., Harvey, Ill. **E. C. Rice** has been appointed manager of the crane division of the company.

T. F. Scannell has been appointed by the Falk Corp., Milwaukee, Wis., as its representative in the Dallas territory with offices at 1410 Magnolia Bldg., Dallas, Tex. His former territory in St. Louis has been taken over by **Fitch S. Bosworth**, 5475 Cabanne Ave., St. Louis, Mo.

Herbert C. Ryding, president of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., was retired on Oct. 15 under the corporation's pension plan.

Obituary

Edward D. Kilburn, 58, formerly vice-president and general sales manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., died of heart failure in New York on Oct. 4.

Louis Skrainka, 73, president of the Union Quarry Co., and vice-president of the Big Bend Quarry Co., both of St. Louis, Mo., died recently.

Herbert H. Dewey, vice-president of the International General Electric Co., Inc., died at his home in Schenectady, N. Y., on Oct. 25 after a brief illness.

Stewart H. Chisholm, 86, one of the nation's leading figures in the steel industry, died at his home in Cleveland, O., recently. He was instrumental in founding and directing several companies, including the American Steel & Wire Co.

Charles Piez, 67, chairman of the board of directors of the Link-Belt Co., died on Oct. 2 at Washington, D. C., of pneumonia. He had been in failing health for some time and had not been active in business since early in 1932.

John W. Kaufman, 67, chairman of the board of directors of the Marble Cliff Quarries Co., Columbus, O., died Oct. 1 at Celina, O. He was also a director of the Arrow Sand & Gravel Co., and was interested in many other enterprises.

▼ *Coming Events* ▲

November 2, 1933, Washington, D. C. — Public hearing of code of soft lime-rock industry, Willard Hotel. Malcolm Pirnie, deputy administrator.

November 9, 1933, Washington, D. C. — Public hearing of code of slate industry, Caucus Room, New House Office Bldg. Malcolm Pirnie, deputy administrator.

November 21, 1933, Washington, D. C.—Public hearing on code of talc and soapstone industry, Palm Room, Willard Hotel, Malcolm Pirnie, deputy administrator.

December 4-8, 1933, New York, N. Y. — Fifty-fourth annual meeting, American Society of Mechanical Engineers, Engineering Societies Bldg., 29 W. 39th St., New York, N. Y.

December 4-9, 1933. New York, N. Y.—Fourteenth Exposition of Chemical Industries. Grand Central Palace, New York.

Neldein U. Wright, 52, manager of the Wright Cast Stone Co., Jackson, Miss., died recently.

Patrick H. Sweeney, 69, secretary and treasurer of the Wolverine Portland Cement Co., Coldwater, Mich., for the past 12 years, died at his home in that city on Oct. 15 after an illness of a year. Mr. Sweeney was born in Coldwater and entered the employ of the company in 1903. He was also active in politics and was at one time city clerk.

Chain Belt Announces California Distributor

The Brown-Bevis Equipment Co., Los Angeles, Cal., has been appointed by the Chain Belt Co., Milwaukee, Wis., as its distributor in southern California for Rex construction equipment. This company, which was recently reorganized, is one of the oldest and largest distributors of equipment in the west.

Caterpillar Appoints Central Indiana Dealer

The Indiana Equipment Co., Inc., 327-329 W. Market St., Indianapolis, Ind., which was recently formed, is the new dealer in central Indiana for Caterpillar tractors and road machinery. The equipment business of Shearer & Mayer has been merged with it. The officers of the new company are: Jesse A. Shearer, president; Arthur R. Lacey, vice president; Arthur G. Wilson, secretary and treasurer. Mr. Shearer is also president of the Indiana Gravel Co., Inc., which operates two sand and gravel plants in Indianapolis.

N.R.A. Appoints Advisors for Feldspar Grinders

The National Recovery Administration on Oct. 26 announced the appointment of Dr. Edward C. Eckel and John O'Donnell as labor advisors for the code for the feldspar grinders' industry. A public hearing of this code will be held Nov. 4.

Correction

An erroneous report that John Catto, Jr., former vice-president of the Republic Portland Cement Co., San Antonio, Tex., had been reelected to that position was published in the October issue of PIT AND QUARRY. We are informed by the company that Mr. Catto has not been connected with it since February, 1933.

Aggregates Statistics

THE demand for aggregates during the first half of 1933 dropped 18.7 per cent. from the comparable period of 1932, according to available data on railway and water shipments as summarized last month. Regionally, however, the trend of shipments ranged from an increase of nearly 8 per cent. in New England to a decline of almost 56 per cent. in the Northwest.

The accompanying map shows the general relationships among the eight regions established for statistical purposes by the Interstate Commerce Commission. The circles are drawn to scale to represent the total shipments of aggregates in each region during the first six months of 1932. The black sectors indicate the decline of comparable figures for 1933. With the exception of the New England region which increased 8 per cent., it is significant that the northernmost regions show the greatest decline in 1933, and the Southern and Southwestern regions the least. Central Eastern, Pocahontas, and Central Western regions lie between, geographically and in the percentages of decline.

▼

By H. H. HUGHES and A. T. COONS
Bureau of Mines, Department of Commerce

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In interpreting these figures it must be remembered that an ever-increasing quantity of aggregates is shipped by motor trucks, and, therefore, actual sales, or consumption, may not have declined quite as drastically as rail-shipment statistics indicate.

Crushed-Stone Declines Least.—A summary of railway shipments of aggregates by regions is given in Table I, both for the second quarter of 1933 compared with 1932 and for the corresponding 6-month periods of the two years.

The increase in shipments in New England amounted to 10.5 per cent. in the second quarter of 1933 alone and 7.9 per cent in the half-year. Crushed-stone producers apparently profited more by this increase, although sand-and-gravel shipments also increased over those of 1932. A similar situation favoring crushed stone prevailed in several other regions, although the 6-month totals for the Great Lakes, Northwestern, and Southwestern regions reveal that sand-and-gravel shipments in 1933 have held up better comparatively than have those of crushed stone. Slag shipments showed a decided improvement in the Southern and Southwestern regions.

By far the greatest decline was registered in the Northwestern region. Sand-and-gravel shipments dropped off 54.2 per cent.; crushed stone, 61.5 per cent., slag, already small, 50.1 per cent. Testimony presented to the Deputy Administrator at the N.R.A. hearing indicated that portable plants are used extensively for aggregates production in the states comprising the Northwestern region. Acceleration in their activity, of course, would result in decreased business for railway-shipping permanent plants. The severe decline in the Northwest region may reflect not only the anticipated trend to motor-truck transportation which has been evident for several years, but also a concerted effort on the part of portable plants to supply the aggregates markets of these states. An actual decrease in consumption no doubt accounts for part of the 56-per cent. decline.

Producers of sand and gravel and crushed stone have been asked by the Bureau of Mines to report the method of transportation used to move their products during 1932. Tabulations of these returns will be available shortly.

Crushed Stone in 1932.—Complete returns from producers of crushed stone in 1932 have been compiled by the United States Bureau of Mines, and a summary of the findings are presented in Table II. Total sales of 51,995,100 short tons of crushed stone, a decline of 28.4 per cent. from those of 1931, substantiates the forecast of last month that previously-reported estimates were too low. Early in the year an estimate of 44,800,000 short tons, based upon correlations of railway shipments and Bureau of Mines statistics, was published in these columns. This figure later was raised to 46,800,000 short tons and published in the Minerals Yearbook as the estimated quantity of crushed stone sold or used by producers in 1932. These estimates, although 13 and 10 per cent. respectively below the final figure, provided a check on crushed-stone production many months before final figures were available.

Of particular significance is the fact that the May estimate of the quantity of crushed stone used as railroad ballast in 1932, 3,980,000 short tons, corresponds almost exactly with the final figure, 3,974,540 short tons. The deficiency, therefore, lies entirely in the quantity of crushed stone used for concrete and road metal. The estimate for this material was based principally

Table I.—SUMMARY OF RAILWAY SHIPMENTS OF AGGREGATES IN THE SECOND QUARTER OF 1933, BY REGIONS (*short tons*) (a)

Regions	Second Quarter			Calendar Year to June 30		
	1932 July-Sept.	1933[b] July-Sept.	Change from 1932 (*per cent.*)	1932	1933[b]	Change from 1932 (*per cent.*)
New England:						
Sand and gravel	33,495	36,088	+ 7.7	39,295	40,173	+ 2.2
Crushed stone	159,052	176,704	+11.1	172,614	188,385	+ 9.1
Furnace slag						
Total	192,547	212,792	+10.5	211,909	228,558	+ 7.9
Great Lakes:						
Sand and gravel	878,797	627,233	−28.6	981,157	713,544	−29.3
Crushed stone	624,430	385,626	−39.2	721,556	441,784	−38.8
Furnace slag	139,398	95,609	−31.4	240,127	148,314	−38.2
Total	1,642,625	1,108,468	−32.5	1,942,840	1,303,642	−32.9
Central Eastern:						
Sand and gravel	1,081,441	728,126	−32.7	1,467,153	1,016,039	−30.7
Crushed stone	817,419	734,327	−10.2	1,095,866	958,476	−12.5
Furnace slag	283,943	294,136	+ 3.6	547,218	451,743	−17.4
Total	2,182,803	1,756,589	−19.5	3,110,237	2,426,258	−22.0
Pocahontas:						
Sand and gravel	223,982	190,460	−15.0	389,684	292,174	−25.0
Crushed stone	98,394	109,630	+11.4	176,365	192,191	+ 9.0
Furnace slag	21,359	19,245	− 9.9	24,434	19,591	−19.8
Total	343,735	319,335	− 7.1	590,483	503,956	−14.7
Southern:						
Sand and gravel	1,240,663	1,213,325	− 2.2	2,302,172	2,164,076	− 6.0
Crushed stone	917,076	793,627	−13.5	1,457,479	1,501,235	+ 3.0
Furnace slag	135,206	151,846	+12.3	179,048	231,683	+29.4
Total	2,292,945	2,158,798	− 5.9	3,938,699	3,896,994	− 1.1
Northwestern:						
Sand and gravel	1,656,244	753,010	−54.5	1,788,242	818,737	−54.2
Crushed stone	401,841	160,940	−59.9	500,790	192,632	−61.5
Furnace slag	473	406	−14.2	1,272	635	−50.1
Total	2,058,558	914,356	−55.6	2,290,304	1,012,004	−55.8
Central Western:						
Sand and gravel	1,781,751	1,128,772	−36.6	2,389,178	1,683,848	−29.5
Crushed stone	498,771	482,853	− 3.2	775,326	779,662	+ 0.6
Furnace slag		43		259	465	+79.5
Total	2,280,522	1,611,668	−27.0	3,164,763	2,463,975	−22.1
Southwestern:						
Sand and gravel	1,252,233	1,281,220	+ 2.3	2,165,897	2,136,788	− 1.3
Crushed stone	558,545	522,665	− 6.4	1,023,987	910,747	−11.1
Furnace slag	6,958	14,116	+102.9	9,133	19,109	+109.2
Total	1,817,736	1,818,001	+ 0.01	3,199,017	3,066,644	− 4.3

[a] Compiled from reports of the Interstate Commerce Commission.
[b] Figures for 1933 are subject to revision.

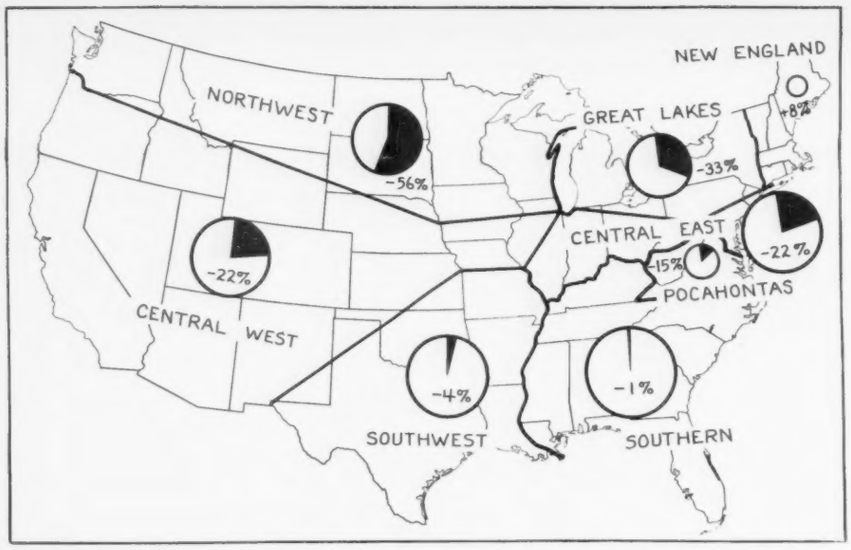


Fig. 1. Railway shipments of aggregates for the first six months of 1932 (total area of circles) and percentage of decline from 1932 to 1933 (area of black sectors).

upon the correlation between railway shipments of crushed stone and Bureau of Mines production figures (exclusive of railroad ballast) from 1928 to 1931, during which years the percentage of total production represented by railway shipments amounted to 47.7, 44.1, 42.9, and 39.3 per cent., respectively. Continuing this trend, it appeared that about 36 or 37 per cent. of 1932 production must have been shipped by railway. It is now evident, however, that motor-truck shipments were relatively better maintained with the result that railway shipments amounted to only 31.8 per cent. of crushed-stone production, exclusive of railroad ballast.

Enough data are not immediately available to explain the exact cause of the drastic decline in railway shipments from 1931 to 1932. Apparently, however, activity in secondary-road construction provided a stimulus for production of crushed stone by governmental units or by contractors operating for them. Virtually all this material was transported by motor trucks. Data are now being compiled to indicate the quantity of material produced by noncommercial agencies. In 1931 this production amounted to a little more than 10 per cent. of the Bureau of Mines total figure. An increase in the percentage for 1932 would explain the steep decline in railway shipments.

Adequate statistics on production by portable plants also would aid in clarifying the situation. Claims have been made that aggregates produced by portable outfits and shipped by motor trucks actually increased from 1931 to 1932. If these claims are correct, it might be assumed that the entire decline in production was absorbed by the permanent or so-called "commercial plants," which, of course, would be reflected in a drastic decline in rail shipments. Additional data relating to the problem will be available in a few weeks.

Table II.—SUMMARY OF SALIENT STATISTICS OF CRUSHED STONE SOLD OR USED BY PRODUCERS, 1931-1932

Kind of Stone		1931	1932[a]	Change from 1931 (*per cent.*)
Concrete and road metal:				
Granite, quantity	*short tons*	5,223,550	3,033,890	−41.9
value		$6,142,768	$3,031,162	−50.7
value per ton		$1.18	$1.00	−15.3
Basalt and related rocks:				
quantity	*short tons*	11,669,830	7,948,290	−31.9
value		$12,792,313	$7,587,449	−40.7
value per ton		$1.10	$0.95	−13.6
Limestone, quantity	*short tons*	42,121,430	32,612,550	−22.6
value		$39,197,020	$28,650,198	−26.9
value per ton		$0.93	$0.88	− 5.4
Sandstone, quantity	*short tons*	2,355,340	1,518,120	−35.5
value		$2,385,408	$1,692,935	−29.1
value per ton		$1.01	$1.11	+ 9.9
Miscellaneous, quantity	*short tons*	4,441,370	2,907,710	−34.5
value		$4,390,991	$2,690,030	−38.7
value per ton		$0.99	$0.93	− 6.1
Total, quantity	*short tons*	65,811,520	48,020,560	−27.0
value		$64,908,509	$43,651,774	−32.7
value per ton		$0.99	$0.91	− 8.1
Railroad ballast:				
Granite, quantity	*short tons*	1,115,320	863,460	−22.6
value		$966,664	$870,125	− 9.9
value per ton		$0.87	$1.01	+16.1
Basalt and related rocks:				
quantity	*short tons*	552,610	433,060	−21.6
value		$561,113	$440,377	−21.6
value per ton		$1.02	$1.02	0.0
Limestone, quantity	*short tons*	4,480,470	2,450,970	−45.3
value		$3,555,257	$1,748,412	−50.8
value per ton		$0.79	$0.71	−10.1
Sandstone, quantity	*short tons*	249,220	81,300	−66.3
value		$215,560	$75,782	−64.9
value per ton		$0.86	$0.93	+ 8.1
Miscellaneous, quantity	*short tons*	415,270	145,750	−64.9
value		$197,861	$105,295	−46.7
value per ton		$0.47	$0.72	+53.2
Total, quantity	*short tons*	6,812,890	3,974,540	−41.7
value		$5,496,455	$3,239,991	−41.1
value per ton		$0.81	$0.82	+ 1.2
Grand total, quantity	*short tons*	72,624,410	51,995,100	−28.4
value		$70,404,964	$46,891,765	−33.4
value per ton		$0.97	$0.90	− 7.2

[a]Final figures as compiled by A. T. Coons, Mineral Statistics Division

New Equipment Firm Organized in St. Louis

A new company known as the Mississippi Valley Equipment Co., 511 Locust St., St. Louis, Mo., has taken over the business of the W. A. Zelnicker Supply Co. All types of power and industrial machinery, equipment and supplies are handled. This company was formed by R. H. Whisler, A. R. Topping and C. H. Wehner, all former employees of the defunct Zelnicker company. Mr. Wehner had recently been dealing in equipment under his own name.

Kron Company Appoints Nine New Distributors

The Kron Co., Bridgeport, Conn., manufacturers of industrial automatic dial scales, have appointed the following new distributors: The Equipment Engineering Co., 52 Whitney Ave., New Haven, Conn.; R. S. Kerr & Co., 610 Means St., Atlanta, Ga.; The Equipment Engineering Co., 210 S. Pennsylvania Ave., Indianapolis, Ind.; Ebbert & Kirkman Co., Inc., Birmingham, Ala.; William N. Schwab, Los Angeles, Cal.; Coe-Mantes Scale Co., San Francisco, Cal.; Roy E. Sampson, 20 Furniture Bldg., Evansville, Ind.; B. F. Crawford Co., 10 No. First St., Terre Haute, Ind.; Mechanical Equipment Co., Howard Ave. and Carondelet St., New Orleans, La.

Manitowoc Appoints New Wisconsin Representative

The Equipment Sales & Service Co., Milwaukee, Wis., has been appointed agent in Wisconsin for the Manitowoc Engineering Works, Manitowoc, Wis., manufacturers of cement plant equipment, Speedcranes, shovels and draglines, and other equipment and supplies.

The George Haiss Mfg. Co., Inc., New York City, has appointed the H. Y. Smith Co., 241 E. Erie St., Milwaukee, Wis., as distributor for its equipment in that territory.

Latest Portland-Cement Statistics

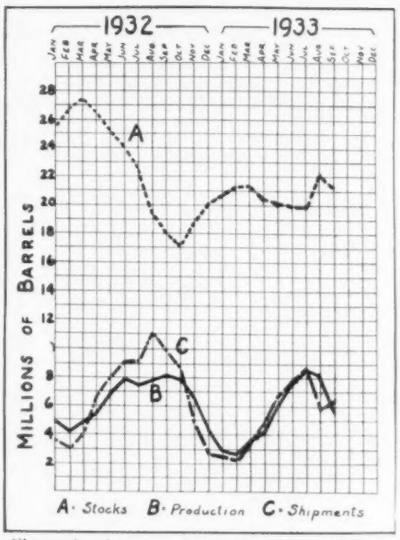


Chart showing monthly production, shipments and stocks on hand at end of month from January, 1932, to September, 1933.

THE Portland-cement industry in September, 1933, produced 5,638,000 bbl. of cement, shipped 6,517,000 bbl. from the mills, and had in stock at the end of the month 21,199,000 bbl. The production of Portland cement in September, 1933, showed a decrease of 31.3 per cent. and shipments a decrease of 33.0 per cent., as compared with September, 1932. Portland-cement stocks at the mills were 18.6 per cent. higher than a year ago.

The statistics here given are compiled from reports for September, received by the Bureau of Mines, from all manufacturing plants except three, for which estimates have been included in lieu of actual returns.

In the following statement of the relation of production to capacity the total output of finished cement is compared with the estimated capacity of 164 plants at the close of September, 1933, and of 165 plants at the close of September, 1932.

RATIO (*per cent.*) OF PRODUCTION TO CAPACITY

	September		August	July	June
	1932	1933	1933	1933	1933
The month	36.9	25.5	35.9	37.6	35.2
The 12 months ended	30.6	25.5	26.5	26.3	26.0

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1932 AND 1933 (*In thousands of barrels*)

Month	Production		Shipments		Stocks At End of Month	
	1932	1933	1932	1933	1932	1933
January	5,026	2,958	3,393	2,502	25,778	20,624
February	3,971	2,777	3,118	2,278	26,657	21,125
March	4,847	3,684	3,973	3,510	27,545	21,298
April	5,478	4,183	6,536	4,949	26,496	20,542
May	6,913	6,262	8,020	6,709	25,394	20,117
June	7,921	7,804	9,264	7,979	24,043	19,936
July	7,659	8,609	9,218	8,697	22,512	19,848
August	7,835	8,223	10,968	5,994	19,398	22,078
September	8,210	5,638	9,729	6,517	17,878	21,199
October	7,939	.....	8,743	.....	17,084	.....
November	6,462	.....	4,782	.....	18,788	.....
December	4,248	.....	2,835	.....	20,205	.....
Totals	76,509	.....	80,579	.....	.....	.....

PRODUCTION AND STOCKS OF CLINKER BY MONTHS, IN 1932 AND 1933 (*In thousands of barrels*)

Month	Production		Stocks End of Month		Month	Production		Stocks End of Month	
	1932	1933	1932	1933		1932	1933	1932	1933
January	6,107	3,036	8,184	6,092	July	6,613	8,569	7,889	6,832
February	5,176	3,110	9,375	6,422	August	7,078	7,835	7,175	*a*6,474
March	5,443	4,147	10,025	6,890	September	7,703	5,600	6,708	6,440
April	5,924	4,520	10,511	7,146	October	7,259	.....	6,093	.....
May	6,273	5,848	9,922	6,769	November	6,290	.....	5,938	.....
June	6,803	7,836	8,877	6,840	December	4,335	.....	5,995	.....

a Revised.

DISTRIBUTION OF CEMENT

Shipped to—	August		September		Shipped to—	August		September	
	1932	1933	1932	1933		1932	1933	1932	1933
Alabama	43,836	43,833	19,699	37,662	New Jersey	342,947	136,598	263,670	208,873
Alaska	1,570	1,153	660	870	New Mexico	11,438	10,334	10,703	10,141
Arizona	10,833	7,173	16,834	9,568	New York	1,437,016	671,520	1,210,601	735,060
Arkansas	33,764	37,875	26,628	36,334	North Carolina	45,680	28,750	24,053	38,023
California	410,822	467,953	361,507	465,552	North Dakota	16,872	8,634	28,640	15,346
Colorado	58,040	62,639	59,394	59,528	Ohio	774,702	224,994	678,551	252,557
Connecticut	100,729	52,886	63,306	64,110	Oklahoma	135,342	65,182	127,325	75,504
Delaware	32,473	3,729	17,278	24,153	Oregon	63,606	29,112	44,597	27,519
Dist. of Col	109,666	92,921	119,017	82,678	Pennsylvania	604,752	365,210	500,591	390,921
Florida	49,148	40,668	28,320	33,952	Porto Rico	820	7,088	2,775	12,125
Georgia	106,631	29,751	72,034	27,079	Rhode Island	31,578	11,673	17,542	19,214
Hawaii	17,666	9,728	26,747	13,299	South Carolina	22,402	10,640	8,681	11,846
Idaho	10,689	12,859	5,582	15,348	South Dakota	32,468	11,546	90,970	28,590
Illinois	867,859	996,408	779,476	881,269	Tennessee	118,730	39,283	114,020	42,073
Indiana	557,005	238,572	441,616	218,104	Texas	392,333	210,589	310,541	189,125
Iowa	431,321	142,845	563,793	223,434	Utah	25,011	38,615	11,733	41,750
Kansas	91,387	60,913	92,223	56,824	Vermont	56,063	12,785	29,887	20,088
Kentucky	207,134	135,378	230,591	122,957	Virginia	115,664	56,154	85,343	61,636
Louisiana	167,844	28,325	193,661	46,683	Washington	168,362	84,254	140,586	84,053
Maine	77,546	35,521	29,894	26,523	West Virginia	93,479	49,891	119,731	60,768
Maryland	214,006	74,145	190,030	84,291	Wisconsin	630,006	176,011	459,686	256,521
Massachusetts	308,259	121,269	202,039	176,491	Wyoming	8,387	5,924	11,247	7,619
Michigan	482,658	287,724	659,003	294,624	Unspecified	2,525		11,986	8,680
Minnesota	646,666	137,415	390,343	231,437		10,944,313	5,928,970	9,694,624	6,487,113
Mississippi	58,429	60,345	63,668	67,327	Foreign countries	23,687	65,030	34,376	29,887
Missouri	474,524	230,012	445,735	229,929					
Montana	19,274	12,275	28,855	15,255	Total shipped from cement plants	10,968,000	5,994,000	9,729,000	6,517,000
Nebraska	96,855	33,921	134,212	86,104					
Nevada	97,967	184,288	77,744	210,456					
New Hampshire	29,829	31,659	51,276	27,240					

PRODUCTION AND STOCKS OF CLINKER (Unground Cement), BY DISTRICTS, in SEPTEMBER, 1932 and 1933 (*In thousands of barrels*)

District	Production		Stocks at End of Month	
	1932	1933	1932	1933
Eastern Pa., N. J., and Md	1,420	1,050	811	965
New York & Maine	608	571	440	359
Ohio, Western Pa., and W. Va	735	507	638	566
Michigan	434	299	935	791
Wis., Ill., Ind., and Ky	1,116	599	358	563
Va., Tenn., Ala., Ga., Fla., and La	445	268	479	439
Eastern Mo., Ia., Minn. and S. Dak	949	680	395	392
W. Mo., Nebr., Kans., Okla., and Ark	630	536	435	365
Texas	426	300	241	194
Colo., Mont., Utah, Wyo., and Idaho	235	48	295	216
California	574	670	1,359	1,253
Oregon and Washington	131	72	322	337
Totals	7,703	5,600	6,708	6,440

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN SEPTEMBER, 1932 AND 1933 AND STOCKS IN AUGUST, 1933 (*In thousands of barrels*)

District	September						Stocks at End of August
	Production		Shipments		Stocks at End of Month		
	1932	1933	1932	1933	1932	1933	1933
Eastern Pa., N. J., and Md	1,606	988	1,683	1,183	3,903	4,441	4,636
New York & Maine	628	614	726	480	1,496	1,771	1,638
Ohio, Western Pa., and W. Va	792	527	978	549	2,128	3,145	3,167
Michigan	524	422	849	398	1,274	1,645	1,621
Wis., Ill., Ind., and Ky	1,255	581	1,706	1,041	1,492	1,770	2,229
Va., Tenn., Ala., Ga., Fla., and La	394	282	457	320	1,370	1,778	1,816
Eastern Mo., Ia., Minn. and S. Dak	1,039	669	1,524	1,050	1,892	2,341	2,721
W. Mo., Nebr., Kans., Okla., and Ark	698	445	698	333	1,531	1,811	1,700
Texas	427	271	315	183	717	807	719
Colo., Mont., Utah, Wyo., and Idaho	222	78	194	162	506	328	412
California	514	683	434	708	1,093	984	1,010
Oregon and Washington	111	78	165	110	476	378	409
Totals	8,210	5,638	9,729	6,517	17,878	21,199	22,078

Foreign Developments

Cement, Like Coal, Has Regular Size Graduation

Studies by P. Rosin and E. Rammier reported in *Zement* for Aug. 3, 1933 (22:427-433) lead them to the conclusion that the granular composition of cements, like that of pulverized coal, is regular and can be expressed by the exponential function:

$$R = 100\, e^{-bx^n}$$

$$\text{or } D = 100\,(1 - e^{-bx^n}),$$

in which x means the granular size in microns and R and D the percentage by weight having granular dimensions greater or less than x, respectively. The value b and the exponent n are generally dependent on the fineness; in the case of eight cements investigated n lies close to 1, and for the most part below. In what way the constants of the equation depend on the mode of grinding and the nature of the clinker remains to be explained.

The authors propose to show in a later work what conclusions can be drawn from the discovered regularities and especially how they can be used in computations of theoretical and practical value.

Find Manganese Acts as Iron in Cement Clinker

Although the effect of manganese present in cement clinker has been of practical importance since slags from the steel works began to be used as a cement material, little experimenting has been done to determine that effect. The earlier writers assumed that manganese was merely an impurity that made the cement more sluggish, and even in Dorsch's new book on cement chemistry (1932), manganese is spoken of as a "bothersome ballast." The authors' own experiments, reported in some detail, indicate that manganese can to a considerable extent replace the iron in Portland-cement clinker. In its affinity to lime and its influence on the ease of sintering, the solubility of the raw material and the development of strength, manganese is in practice about equivalent to iron.

When the manganese content runs over 5 per cent., the strength falls off somewhat, and difficulties arise in the burning. The most favorable manganese content (computed as Mn_2O_3) is between 2 and 4 per cent., and corresponds to the formula:

$$1 < \frac{Al_2O_3}{Fe_2O_3 + Mn_2O_3} < 1.6$$

When the clinker is well burned, the manganese occurs as Mn_2O_3. MnO_2 occurs to any appreciable extent only when higher quantities of manganese are present. Clinker containing Mn_2O_3 has a dark gray color; if it contains MnO_2 the color is a grayish black. Brown or rose tints occur only with lower stages of oxidation.—Dr.-Ing. O. Goffin and G. Mussgnug in *Zement* 22:218-221, 231-234, April 27 and May 4, 1933.

Diluted Cements Are Found Unsatisfactory

In Italy, France and elsewhere, varieties of cement are produced by mixing with the clinker or ground cement such substances as pozzuolana, sand and the like. They have been combated on the ground that they are merely "diluted" cements, little or no useful properties being added by the admixture.

Professor Richard Grün and Dr. Hugo Beckmann in *Tonindustrie-Zeitung*, 57:822-824, 832-834 (Aug. 30 and Sept. 4, 1933), report on a series of tests with cements containing as admixtures pulverized-coal ash and slate dust. They find that such cements are inferior to pure cements, and that the reason for diminished concrete strengths is simply that in a mix of a given proportion there is less real cement present if the "diluted" cements are used. Such cements are not "low-lime" cements in the usual sense of the term, which should be restricted to cements consisting 100 per cent. of hydraulic materials but low in CaO.

Claims that such cements are more resistant to the action of acids, because the admixture is not soluble in acid, are not well founded; the effect of such inert admixtures to the cement is no different from the effect of sand, itself largely insoluble silica, in the concrete mix.

Find Alkalies Make Slurry More Fluid

It is well known that clay slip can be made "more fluid"—that is, have a lower viscosity at a given water content—by admixing certain substances. This result depends on phenomena of a colloid-chemical nature and has been studied by numerous investigators.

A study of the similar action of several alkalies on cement slurry is reported by H. Salmang and H. E. Schwiete (based on investigations of E. Zilg) in *Zement* for May 18 and June 1, 1933 (22:264-267, 301-302). In the most favorable concentration, sodium carbonate reduced the viscosity as much as 65.7 per cent. The effect varies between the seven brands of cement used in the tests. With increasing content of soda the viscosity approaches a minimum and then increases again rapidly. Soda is, of course, not suitable for practical application.

Sodium hydroxide, likewise unsuitable for practice, also diminished the viscosity, but not so greatly. The quantity required for attaining minimum viscosity is much less. The effect of sodium silicate is the same as that of the sodium carbonate, but the slurry thickens again with time.

The investigators also found that the lime content and other features of the cement composition have an effect on the viscosity of the slurry, either with or without the electrolyte. Another interesting finding is that while slurry "without admixture" stiffens with time, that with a soda admixture does not.

Good Cements Made of Slag, Gypsum, Dolomite

"Clinkerless" cements, made by mixing finely-ground basic slag with anhydrite and dolomite burned in an electric furnace, showed strength and setting properties well within the range of practical cements, in an investigation by Prof. P. P. Budnikoff and Larissa Gulinov of Kharkov, U.S.S.R. An interesting finding was that neither natural nor artificial anhydrite, gypsum nor dolomite alone with the slag yielded strengths as high as combinations of these materials. The best strengths were from natural or artificial anhydrite with burned dolomite, and from natural anhydrite with dolomite dust. The strength of these cements often exceeds the strength of "blast-furnace cement" containing 15 and 30 per cent. of Portland-cement clinker. A mixture of 85 per cent. slag, 10 per cent. artificial anhydrite and 5 per cent. dolomite burned at 900 deg. gave a 28-day compressive strength (combined storage) of 350 kg. per sq.cm.

A striking result was that in check tests on blast-furnace cements those with 15 per cent. of clinker yielded strengths at 6 months surpassing those of cements with 30 per cent. of clinker.

Part of the tests used Kühl's miniature testing method, and check tests show that this method yields strength figures considerably lower than the results in standard testing.

The investigation is reported in *Tonindustrie-Zeitung* for May 2 (57: 402-3). Slags from two Russian steel works were used; a similar study on a different slag was previously reported in Russian sources.

Traffic News and Comment

Recent I. C. C. Decisions

Cement.—The Interstate Commerce Commission has found justified suspended schedules of carriers proposing to cancel the combination rule for the construction of rates on cement from points in eastern trunk line territory to destinations in western trunk-line territory and in Utah and Wyoming.—I. C. C. Docket I. & S. 3,876, Combination Rule on Cement.

Lime.—The proposed cancellation of the combination rule on lime and plaster between points in western trunk-line territory has been found justified and the order of suspension vacated and the proceeding discontinued.—I. C. C. Docket I. & S. 3,877, Combination Rule on Lime and Plaster.

The commission has found the rates on lime from Denie, Ala., to destinations in Arkansas, Louisiana and Texas, not unreasonable in the past but unreasonable in the future to the extent that they may exceed the scale in 194 I. C. C. 559, computed by using the shortest distance over which carload traffic may move without transfer of lading. New rates are to be made effective not later than Jan. 11, 1934. I. C. C. Docket No. 24,954, Muscle Shoals White Lime Co. *v.* A. G. S. *et al.*

Sand. — Having found the rate charged on sand from Clayton, Ia., to Omaha, Neb., applicable and not unreasonable, the commission has dismissed the complaint.—I. C. C. Docket No. 25,697, Sunderland Bros. Co. *v.* C. M. St. P. & P. *et al.*

Examiners's Report

Plaster-board.—Examiner C. W. Griffin proposes that the commission find the rates on plaster-board from Fort Dodge, Ia., Southard, Okla., Acme and Sweetwater, Tex., to destinations in California, New Mexico, Colorado, Arizona, Nevada and Oregon, not unreasonable and dismiss the complaint in I. C. C. Docket No. 25,553, Certainteed Products Corp. *v.* A. T. & S. F. and Sub. No. 1, United States Gypsum Co. *v.* Amador Central *et al.*

New Complaints Filed

Talc.—New rates and reparation are sought in connection with the shipment of talc and waste talc from Waterbury and Johnson, Vt., to destinations in official territory, on an allegation of violations of Sections 1, 4 and 6.—I. C. C. Docket No. 26,207, Eastern Magnesia Talc Co., Burlington, Vt. *v.* A. & W. *et al.*

Rate-Committee Dockets

New England Freight Assn.

Agricultural Lime.—To assist the potato growers of Aroostook County on material which is needed immediately as a soil corrective, the carriers propose to reduce the rates on agricultural lime, car-load minimum weight 60,000 lb., from Rockland, Thomaston and Warren, Me., to Ar. V., B. & Ar., and C. P. destinations. A statement of proposed rates will be furnished on request.—Docket No. 31,219.

Amiesite and Crushed Stone.—Shippers propose rates on (A) crushed stone and (B) amiesite[1], from Bethlehem, Pa., to Williamsport, Pa., of (A) $1.50 and (B) $1.63 per net ton.—Docket No. 31,448.

Shippers at Oriskany Falls are proposing a line of rates on crushed stone to New York Central destinations representative of which are, Saranac Lake $1.60; Owl's Head $1.60; Chasm Falls $1.70; Constable $1.70; Santa Clara $1.60; and Helena $1.70. They are proposing rates on amiesite 13c. per ton above the rates on uncoated crushed stone.—Docket No. 31,461.

Cement.—Shippers propose a reduction in the rate on cement, car-load minimum weight 50,000 lb., from Buffalo, N. Y., stations to North Tonawanda, N. Y., from 6 c. to 5 c. per 100 lb.—Docket No. 31,471.

Crushed Stone.—A reduction in the rate on crushed stone[1] from Bound Brook, N. J., to Point Pleasant, N. J., from $1.27 to 90 c. per net ton is proposed by shippers.—Docket No. 31,466.

Shippers propose a reduction of 20 c. per ton in the rate on crushed stone from New York and Campbell, Pa., to Cedarville, Woodville, Gallant Green, Hughesville, Oaks, Charlotte Hall, New Market, Mechanicsville, Jarboes, Forrest Hall and Brandywine, Md., to $1.75 per net ton.—Docket No. 31,520.

Fluxing Stone.—Carriers propose a rate of $2 10 per gross ton to apply from Martinsburg, W. Va., to Erie, Pa., on fluxing stone, car-load minimum weight in container cars, 110,000 lb., in open-top cars[1].—Docket No. 31,332, Sup. 1.

Ground Limestone.—Carriers propose to revise the description in agency and individual line tariffs naming rates on limestone, ground or pulverized, also agricultural limestone to read: "Limestone, ground or pulverized, or limestone dust, unburned, in box cars," for application within trunk-line territory and from trunk line to C. F. A. and N. E. F. A. territories.—Docket No. 31.426.

Lime.—Shippers at Engle, W. Va., are asking for the publication of rates on carbonate of lime or recarbonated waste, car-load minimum weight 40,000 lb., 1 c. per 100 lb. higher than the rates on agricultural lime.—Docket No. 31,458.

Shippers propose rates on (A) ground limestone and on (B) chemical or land lime, from Annville, Palmyra and Swatara, Pa., to Englishtown and Runyon, N. J., of (A) 13 c. and (B) 14 c. per 100 lb.—Docket No. 31,434.

Sand.—A reduction in the rate on sand in open-top cars without tarpaulin or other protective covering,[1] from the Mapleton district in Pennsylvania to Kaylor and Dewey, Pa., from $2.75 to $1.80 per net ton is proposed by shippers.—Docket No. 31,431.

Carriers propose rates on the same commodity to the same destinations as above from Hancock and Round Top, Md., of $1.90 and from Cumberland, Md., of $1.80 per net ton.—Docket No. 31,431, Sup. 1.

From the Hancock-Berkeley Springs district carriers propose a rate of $1.90 per ton in Sup. 2 to the above docket.

Central Freight Assn.

Cement.—Shippers have asked for a reduction in the rate on cement from Speeds, Ind., to College Hill, N. College Hill and Mt. Healthy, O., from 11½ c. to 11 c. per 100 lb.—Docket No. 34,702.

Crushed Stone.—Shippers are asking for the publication of a commodity rate on crushed stone and related articles from Middlepoint, O., to Kokomo, Ind., of $1.25 per net ton.—Docket No. 37,340.

A rate on crushed stone and related articles from Spore, O., to Buffalo Creek, W. Va., of $1.90 per net ton has been proposed by shippers.—Docket No. 37,401.

Shippers proposed the following reduced rates per net ton to apply on crushed stone and related articles from Ashtabula, O., and Ashtabula Harbor, O.: To Simons, O., 60 c; to Osgood and Amasa, Pa., 70 c.; to Stoneboro and Sandy Lake, Pa., 80 c.; to Polk Lake and Franklin, Pa., 90 c.; and to Oil City, Pa., $1.00.—Docket No. 37,427.

The following reduced rates per net ton are proposed by shippers at Lewisburg, O., to apply to stations on the C. G. R. R.: To Forrestville, Summerside and Hamlet, O., $1.00; to Bethel and Felicity, O., $1.05; to Russelville, O., $1.15; and to Coney Island, O., 95 c.—Docket No. 37,440.

Fluxing Stone.—Carriers propose to reduce the proportional rate on dolomite or fluxing stone on ex-lake traffic from Cleveland, O., to Sharon and Sharpsville, Pa., from $1.01 to 80 c. per gross ton. This does not include handling charges at Cleveland.—Docket No. 37,312.

Shippers propose a reduction in the rate on fluxing stone from Carey and McVitty's, O., to Cincinnati, O., from $1.76 to $1.66 per gross ton.—Docket No. 37,471.

Lime.—A reduction in the rate on agricultural lime, car-load minimum weight 30,000 lb., from Genoa, and

Martin, O., to Strongsville, O., from 15 c. to 8 c., and from Marblehead, O., from 13 c. to 8 c. per 100 lb. is proposed by shippers.—Docket No. 37,-231.

Shippers propose the following reduced rates to apply on lime (A) car-load minimum weight 30,000 lb., and on (B) car-load minimum weight 50,-000 lb., to Brady's Lake, Akron Waterworks Switch, and to Hugo, O.; From Marble Cliff, O., (A) 12½ c., (B) 10 c.; from Marion, O., (A) 13 c., (B) 10½ c.; and from Cedarville, O., (A) 14 c., (B) 11 c. per 100 lb.—Docket No. 37,348.

Sand.—Carriers propose to reduce the rate from Millington, Oregon, Ottawa, Rochelle, Sheridan, Utica and Wedron, Ill., to Tiffin, O., on washed or processed silica sand from $2.76 to $2.52 per net ton, and on crude silica sand from $2.30 to $2.10.—Docket No. 37,338.

Carriers propose to publish a rate on molding sand from Detroit, Mich., to South Bend, Ind., of $1.76 per net ton.—Docket No. 37,500.

Slag.—A reduced rates to apply on crushed commercial slag, car-load minimum weight 80 per cent. of the marked capacity of the car, from Hamilton, O., to Springfield, O., of 90 c. per net ton is proposed by shippers. —Docket No. 37,286.

Illinois Freight Assn.

Sand and Gravel.—It is proposed to publish a rate on sand and gravel, car-load minimum weight. The marked capacity of the car, from Barry, Ill., to B. & O. stations in Illinois, Bradfordton, to Beardstown inclusive and Rochester to Sharpsburg inclusive, of $1.01 per net ton.—Docket No. 7,531-A.

Western Trunk-Line Committee

Amiesite.—Shippers propose the application of the distance schedule of rates shown in Item 235-A, Sup. 30, W. T. L. Tariff 210 for both single- and joint-line application on coated crushed stone, sand and gravel, from Topeka, Kan., to destinations in Kansas.—Docket No. 8,123-1.

Crushed Stone.—A reduction in the rate on crushed stone [1], from Wausau, Wis., to Minneapolis, Minnesota Transfer and St. Paul, Minn., from 9 c. to 7 c. per 100 lb., is proposed by shippers.—Docket No. 2,079-R.

Shippers at Wausau, Wis., propose a reduction in the rate on crushed stone [1] to Manville, N. J., from $7.20 to $6.00 per net ton.—Docket No. 8,-620.

Crushed Stone, Sand and Gravel.—Shippers propose a reduction in the rate on crushed stone, sand and gravel, from Topeka, Kan., to Sabetha, Kan., from 90 c. to 71 c. per ton, to expire Dec. 31, 1933.—Docket No. 1,-694-I.

Lime.—Shippers propose the following rates per 100 lb., all reductions, to apply on lime, car-load minimum weight 30,000 lb., from Green Bay, Wis.; to Iron Mountain, Escanaba, Mich., and Niagara, Wis., 9½ c.; to Manistique, Mich., 12 c.; to Marquette and Ishpemming, Mich., 13½ c.; to Munising and Sault Ste. Marie, Mich., 15 c.; to Ontonagon, Mich., 15½ c.; to Houghton and Hancock, Mich., 16½ c.—Docket No. 2,689-K.

Sand.—The following rates per 100 lb., all reductions, are proposed to apply on silica sand, pumice and volcania ash [2]: To Buffalo Park, Ellis, Hoxie, Johnstown, Kanopolis, Lindsborg, Morland, Natoma, Quinter, Wakeeney and Wilson, Kan.; from St. Louis group, 21½ c.; from Peoria group, 23 c.; and from Chicago group, 23 c. To Winona, Kan.: From St. Louis group, 22 c.; and from the Peoria and Chicago groups, 24 c.—Docket No. 1,376-KK.

Southern Freight Assn.

Crushed Stone, Sand and Gravel.—Carriers propose to amend S. F. A. tariffs, I. C. C. 1,635 and 1,740, by adding 25 c. per ton to the rates on aggregates *via* the V. & S. C. R. R.—Docket No. 3,003.

Cement.—Carriers suggest publication of a rate of 40½ c. to apply on cement from Graystone, Ala., to Minneapolis, Minnesota Transfer, St. Paul, Northfield and Duluth, Minn., Superior, Wis., and Marquette, Mich. —Docket No. 2,848.

Shipper at Kosmosdale, Ky., propose the following rates per 100 lb. to apply on cement: To New York, N. Y., 28 c.; to Philadelphia, Pa., 26 c.; to Baltimore, Md., 25 c.; to Halethorpe, Relay and Elk Ridge, Md., and Washington, D. C., 24½ c.—Docket No. 2,955.

Mica.—Carriers propose a rate of 27½ c. per 100 lb., to apply on dry ground mica, car-load minimum weight 50,000 lb., and on mica schist, car-load minimum weight 60,000 lb., from King's Creek, S. C., to Pensacola, Fla.—Docket No. 2,800.

Lime.—It is proposed by shippers that Items 14,236, 14,238-A and 14,239 of Agent Speiden's I. C. C. 1,641, be amended by changing the commodity description to read, "Lime, hydrated, slacked or unslacked, in sacks, barrels or drums, car-load minimum weight 30,000 lb."—Docket No. 2,902.

Southwestern Freight Bureau

Cement.—Shippers at Okay Junction, Ark., propose a rate on cement, car-load minimum weight 50,000 lb., to Cairo, Ill., of 20½ c. per 100 lb.—Docket No. 1,924.

Crushed Stone.—Shippers at Moline, Kan., are proposing a line of rates on crushed or ground limestone,[1] to various Oklahoma destinations to meet motor-truck competition. Some of the proposed rates per net ton are: Capron and Brink, $1.06; Alva and Noel, $1.10; Avard, $1.14; Waynoka, $1.18; Gage, Shattuck and Goodwin, $1.42; Wakita, $1.02; Canton, $1.26 and to Boise City, $1.78.—Docket No. 1,959.

A reduction in the rate on crushed stone from Arkansas City, Kan., to Cleo and Orienta, Okla., from $1.15 to 97 c. per net ton is proposed by shippers.—Docket No. 2,059.

Crushed Stone, Sand and Gravel.—Shippers propose the establishment of a rule for state and interstate application between points covered by S. W. L. Tariff 162-F, reading: "When track-scales are not available at point of origin or destination and shipment does not pass through a point where the carrier transporting the shipment maintains a track-scale, the shipment shall be delivered upon basis of 10 per cent. above the marked capacity of the car, provided, however, that upon presentation of original or certified copy of invoice showing the actual weight, or satisfactory evidence acceptable to the carrier, as to the actual weight of the shipment, the car shall be delivered, upon basis of such actual weight."—Docket No. 2,084.

Ground Limestone.—Shippers propose the amendment of Mo. Pac. R. R. and St. L. S. F. tariffs, naming rates on lime from points in Arkansas and Missouri to points in the southwest, to provide that the rates on lime will apply also on ground limestone, in bags or sacks, in mixed car-loads with lime. —Docket No. 2,070.

Lime.—Shippers at Dittlinger, New Braunfels, Roundrock, McNeil, Tex., and grouped points propose a rate on lime, car-load minimum weight 30,000 lb., to Oklahoma points, Mudge, Crescent Lorell, Marshall, Douglas and grouped destinations of 27½ c. per 100 lb., and to Oklahoma City, Okla., on unhydrated ground lime, car-load minimum weight 80,000 lb., a rate of 21½ c. per 100 lb.—Docket No. 2,122.

Shippers at the same points propose a rate of 36½ c. per 100 lb., car-load minimum weight 40,000 lb., and 32 c., car-load minimum weight 30,000 lb., on lime to Cheyenne, Wyo.—Docket No. 2,123.

Plaster.—Carriers propose to increase the rate on plaster, stucco, plaster wall-board and related articles from Ft. Dodge, Gypsum and Mineral City, Ia., to Missouri stations, Webster Groves, Mo., to Stratford, Mo., inclusive, from 17 c. to 22 c. per 100 lb. —Docket No. 1,923.

Texas-Louisiana Tariff Bureau

Sand and Gravel.—To permit shippers at Luxello, Tex., to meet the competition of other near pits, they propose the establishment of a rate on sand and gravel,[1] to San Antonio, Tex., of 25 c. per net ton.—Docket No. 8,177-TX.

Trans-Continental Freight Bureau

Keene's Cement.—Shippers request publication of a rate on Keene's cement, car-load minimum weight 80,000 or 85,000 lb., from Medicine Lodge, Kan. (Group G), in Tariffs 1-N and 4-K.—Docket No. 15,562.

[1] The car-load minimum weight will be 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply.

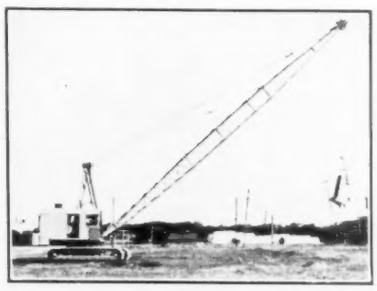
[2] The car-load minimum weight will be the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply.

New Machinery and Supplies

Northwest Announces New Larger Drag-line

The Northwest Engineering Co., Chicago, Ill., announces a new drag-line of greater capacity than the 2-cu. yd. model which was brought out some time ago. This machine, it is claimed, combines large capacity with the simplicity, mobility and economy ordinarily not found in machines of this size.

The power plant is an 8-in. by 9-in. Northwest-Twin City engine, operating at slow speed, which is said to have torque characteristics and hanging-on qualities that meet with drag-line requirements. Power takeoff is through helical cut gears enclosed and mounted on ball and roller bearings and running in oil. The Northwest



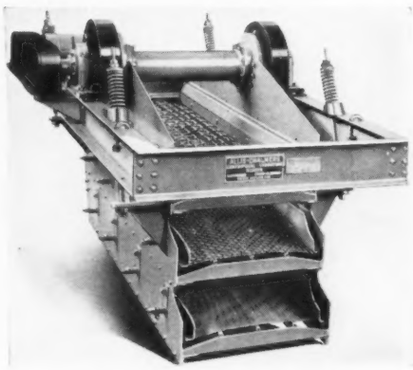
Large-capacity drag-line.

cushion clutch is standard equipment and guards against overloads. It transmits full engine power but reduces maximum stresses on every part under power when the hoist rope is tensioned. Swinging clutches are of the cone type and are provided with oversize blocks.

Steering is accomplished in the usual manner with positive traction on both crawlers while turning as well as when going straight ahead. All gears in the crawler base are fully enclosed by a heavy housing and the gears run in oil. Treads are self-cleaning. The use of hold-down rotating rollers in effect doubles the diameter of the rotating path and results in many advantages including compactness, short tail swing, etc.

Centrifugal Vibration in Allis-Chalmers Screen

The Allis-Chalmers Mfg. Co., Milwaukee, Wis., manufactures a Style B centrifugal vibrating screen which is used for sizing practically any wet or dry materials that are sized for commercial purposes. The rapid mechanically-produced eccentric motion of this screen is said to have the same intensity of vibration regardless of the tonnage fed to the screen, making it



Centrifugal vibrating screen.

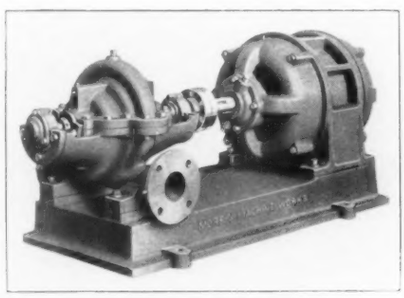
adaptable for heavy loads and the maximum range of sizes.

The screen frame is built of two heavy I-beams fastened together by cross ties. The side members support the motor, the frame bearings and the four corner springs which float the body. The screen body consists of two steel side plates reinforced inside by longitudinal angles and connected together by cross angles. Because the body is supported on these springs the mechanism can be removed without disturbing the vibrating member.

The driving mechanism is a self-contained unit located above the body and supporting frame. The drive shaft is enclosed by a rigid tube which protects the two roller bearings supporting the shaft and also stiffens the body. Two steel plate balance wheels on the shaft are adjustable and are protected by guards. Labyrinth seals also prevent dust from getting into the bearings. Spring and cable suspension of these screens is recommended but they can be bolted to a supporting structure. These screens are made in all sizes in one, two, or three decks.

Morris Develops High-Speed Centrifugal Pump

The Morris Machine Works, Baldwinsville, N. Y., announces a new line of double-suction, split-case centrifugal pumps specially designed for operation at high speed. They can be



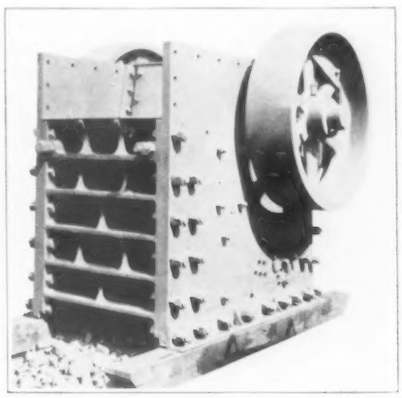
High-speed centrifugal pump.

direct connected to electric motors or steam turbines operating at 3500 r.p.m., or may be connected through belt or gears to lower speed power units. They are built in sizes of from $1\frac{1}{2}$ to 5 in.

These pumps follow in general the standard centrifugal pump design but such element has special provisions to meet high-speed requirements. The impellers, shaft and couplings are first individually tested for perfect rotative balance and then the entire unit is similarly tested before the pump is assembled. The design and finish of the impeller are specially refined to minimize friction and eddy losses. Deep-groove, heavy-duty precision ball bearings are used on each side of the pump.

Roller-Bearing Primary Crusher Made By Western

The Austin-Western Road Machinery Co., Chicago, Ill., announces the new Western 18-in. by 38-in. roller-bearing primary crusher. This machine is similar in its construction to



Roller-bearing primary crusher.

the No. 940 and 440 crushers which have been on the market for several years.

This crusher has a built-up frame with rolled-steel side plates into which the end castings are fitted with keys. It is equipped with manganese steel jaws and check plates which are reversible and easily changed. The shaft and the SKF roller bearings used in this machine are extra large, the bearings being claimed by the company to be the largest ever used in a crusher.

New One-Piece Ventless Blasting Cap Developed

The Hercules Powder Co., Wilmington, Del., announces a new all-metal delay electric blasting cap of original design. The features of this new detonator are the firing and delay elements which produce practically no gas when burning, making possible the

use of a solid, one-piece, ventless shell. It is claimed that this cap, having no hot gas, cannot ignite the dynamite and that, as there is no gas-escape opening, no moisture can enter. U. S. patents have been applied for.

Develop MSA Light-Weight Mine Protective Headgear

The Mine Safety Appliances Co., Pittsburgh, Pa., has developed a mine protective headgear known as the MSA Type D Skullgard. This is made in a single piece of laminated Micarta and is said to be light in weight and yet offering maximum protection against the head hazards encountered in mining operations. Micarta is also waterproof and does not soften from water or perspiration. The shell is

Safety headgear.

flexible at the base end and is equipped with a soft rubber cushioned lining with fabric cradle straps which are said to permit free ventilation and to form a shock absorber. The Skullgard has been officially approved by the Pennsylvania Compensation Rating and Inspection Bureau.

Westinghouse Improves Its Ventilated Motors

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has perfected a new method of motor ventilation which makes possible enclosed motors up to 200 hp. with mounting dimensions comparable to open types. Internal and external air is circulated by fans through paths which cause rapid transfer of heat from the internal air to the frame and from the frame to the external air.

The frame consists of two ducts, one leading from one end of the frame to the other inside the motor. The internal air is sealed within the motor and is circulated throughout all its parts. The second set of ducts alternate with the first and pass from each end to the center of the motor and the proximity of the external to the internal air causes a heat exchanger effect. Because of their full protection these motors may also be used outdoors.

Ventilated motor.

Safety Is Claimed for New Wire-Rope Socket

The American Steel & Wire Co., Chicago, Ill., has announced the new Fiege Tiger-Claw wire-rope socket which is claimed to eliminate the difficulty and danger of wire rope socketing. This socket is composed of three simple parts, a socket, a sleeve and a plug. No flame or hot metal is required in the operation. They are made in sizes for wire rope of ⅜-in. diameter and larger. A circular published by the company gives instructions for attaching these sockets.

New wire-rope socket.

Kron Co. Makes Improved Portable Platform Scale

The Kron Co., Bridgeport, Conn., manufacturers of industrial dial scales, have developed a new portable platform scale which incorporates many new features. The 21-in. by 29-in. scale platform is so designed that the platform plate does not overhang the suspension loops, permitting extreme loads to be placed on the edges of the platform without affecting the accuracy of the scale. Another feature is that the levers have no lateral movement. The four wheels on this scale are made of a combination of Bakelite and hard rubber. If desired, however, three-wheel construction can be furnished. The standard Kron ball-bearing, one-cam translation mechanism is used.

Link-Belt Distributor in Arizona Moves Office

The Mine & Smelter Equipment Co., Phoenix, Ariz., which has represented the shovel and crane division of the Link-Belt Co. for many years, has moved to larger and better quarters at 110-116 So. Third Ave.

Statement of Ownership

PIT AND QUARRY

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of PIT AND QUARRY, published bi-weekly at 538 S. Clark Street, Chicago, Ill., for October 1, 1933.

State of Illinois, County of Cook, ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared H. W. Baumgartner, who, having been duly sworn according to law, deposes and says that he is the business manager of PIT AND QUARRY, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, Complete Service Publishing Co.; Editor, S. A. Phillips; Business Manager, H. W. Baumgartner, all of Chicago, Ill.

2. That the owner is Complete Service Publishing Co., Chicago, Ill. That the stockholders owning 1% or more of the total amount of stock are: H. W. Baumgartner and I. A. Baumgartner, both of Chicago, Ill.

3. That there are no bondholders, mortgagees, or other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him.

H. W. BAUMGARTNER,
Business Manager.

Sworn to and subscribed before me this 26th day of September, 1932.

(Seal) MICHAEL MOTTO,
Notary Public.

My commission expires Aug. 2, 1937.

Saving Through Safety

National Safety Council Holds Annual Congress

THE recent annual safety sessions of the Cement and Quarry Sections of the National Safety Council, held Oct. 2 to 6 at the Hotel Stevens, Chicago, Ill., featured practical safety problems which must be met during the period of expected expansion within the industry.

This in fact was the theme of all the sessions of the congress which represented twenty-five different industries and the additional fields of public, home and school safety. These sessions were spurred on by an inspirational message from President Franklin D. Roosevelt in which he stated:

> The conservation of human life and the prevention of accidental injuries are of vital importance to our welfare and happiness. While much progress has been made in accident prevention during the past two decades, particularly in the field of industry, there is still much that should be done.
>
> We sacrificed 88,000 lives through accidents last year. Approximately 9,000,000 people were injured. The economic costs run close to $2,000,000,000. The social cost is immeasurable. Briefly stated, that is our national accident problem, and it certainly offers a most serious challenge to the American people.
>
> I extend my cordial greetings and best wishes with the hope that you will find abundant inspiration for intensified efforts in all fields of human activities throughout the coming year.

The theme of President Roosevelt's letter was supplemented by the formal resolution adopted at the general initial session of the congress. The delegates, assembled from all parts of the United States and from several foreign countries, pledged themselves throughout the coming year to concentrate their activities as regarding "industrial safety" in the following specific channels:

> The safeguarding of all mechanical equipment and the constant use of such devices; the revision of hazardous manufacturing processes; the widening of our engineering pursuits; regular and complete safety inspections and research in all industries, followed by prompt application of approved remedial measures; more psychological studies of the mental aspects of accidents; extension of safety-contest plans; a wider recognition of the close relationship between industrial health and safety; and full coöperation of the National Safety Council with affiliated community councils throughout the country.

Another of the formal pledges of the delegates related to the present economic revival stated as follows:

> And be it further resolved, that since, under the President's program for reëmployment, employers of labor everywhere are assuming new financial obligations through the addition of new employees, we pledge unceasing efforts toward realization of the important economies of efficient accident prevention, thereby helping directly the employers who have generously assumed the new responsibilities imposed by the National Recovery Administration. And we further pledge our allegiance to President Roosevelt for his able leadership and his unswerving determination to bring the American people out of economic chaos into their rightful prosperity.

The following general officers were elected:

> President, John E. Long, Delaware & Hudson R. R. Corp., Albany, N. Y.; managing director, W. H. Cameron, Chicago, Ill.; treasurer, W. E. Worth, International Harvester Co., Chicago, Ill.; vice-president for public safety, Robert I. Catlin, Aetna Life Ins. Co., Hartford, Conn.; vice-president for engineering, J. E. Culliney, Bethlehem Steel Co., Bethlehem, Pa.; and vice-president for industrial safety, George H. Warfel, Union Pacific R. R. Co., Omaha, Neb.

Attendance at the sessions of the Cement and the Quarry Sections was not as large as during some former years, due no doubt to the present business status of the industries. But there were lively discussions among the delegates who did attend, representing a large variety of operating companies.

The special cement and quarry sessions were supplemented by a considerable number of special-subject sessions, which represented a new feature of the Annual Safety Congress. The cement and the quarry sessions were held during the forenoon periods, and all the subject sessions were held during the afternoon. Probably foremost in interest to cement and quarry safety delegates were the subject sessions devoted to *Dust Problem in Industry; Dermatitis; A Practical Medical Program for Industry; The Eye and Its Relation to Safety; The Safe Use of Electricity in Industry; Falls of Persons;* and *Maintaining Interest in Safety.*

Other features of general interest to cement and quarry delegates were the early-morning sessions of the Psychology Class, which considered the theme of *Mental Training for Safety*, under the leadership of Dr. Harold S. Hulbert, a national authority in the field of psychiatry and practical problems of industrial psychology.

The exhibit of mechanical safety appliances and safety educational de-

Representatives of the Quarry Section: Otho M. Graves (left), general chairman; A. L. Worthen and Norman G. Hough, members at large.

Representatives of the Cement Section: J. B. Zook (left), general chairman; E. Posselt and H. Vanderwerp, members at large.

vices, held in the Exposition Hall of the hotel, was a complete display and was supplemented by special safety exhibits at A Century of Progress. Protective equipment was featured at the exposition. This included head and eye protection, foot and leg protection, mine-safety equipment, general protective apparel, first-aid surgical supplies, and hospital equipment. The dust problem was given prominence in this display, including a dust-count demonstration twice daily, dust-collectors and control systems, respirator protections, and educational-bulletin displays featuring the safety educational methods.

At the first session of the Cement Section on Tuesday morning the following new officers were elected:

General chairman, J. B. Zook, Great Lakes Portland Cement Corp., Buffalo, N. Y.; vice-chairman, W. W. Hamilton, Alpha Portland Cement Co., Easton, Pa.; secretary, A. J. R. Curtis, Portland Cement Assn., Chicago, Ill.; News Letter editor, Jack Dempster, Canada Cement Co. Ltd., Port Colborne, Ont., Can.; Engineering Committee chairman, Frederick B. Hunt, Nazareth Portland Cement Co., Nazareth, Pa.; Membership Committee chairman, H. A. Reninger, Lehigh Portland Cement Co., Allentown, Pa.; Poster Committee chairman, M. P. Greer, Marquette Cement Mfg. Co., Cape Girardeau, Mo.; Program Committee chairman, D. B. Coleman, Missouri Portland Cement Co., St. Louis, Mo.; members at large, R. B. Fortuin, Pennsylvania Dixie Cement Corp., Nazareth, Pa.; E. Posselt, International Cement Corp., New York, N. Y.; C. E. Ralston, Pittsburgh Plate Glass Co., Pittsburgh, Pa.; F. E. Town, Manitowoc Portland Cement Co., Manitowoc, Wis.; and H. Vanderwerp, Medusa Portland Cement Co., Cleveland, O.

General Chairman Elect J. B. Zook reviewed the safety progress of the Cement Section during the past year.

A. J. R. Curtis, assistant to the general manager, Portland Cement Assn., Chicago, in his *Analysis of Accidents in the Cement Industry*, voiced the opinion that, during the period of increased plant activity when old workers unemployed for some time and new workers would be added, there must be increased attention given to accident-prevention programs to prevent a sharp upgrade in the annual accident record of the industry.

Dr. C. H. Ogden, surgeon, Illinois Steel Co., Chicago, in his paper on *Safeguarding the Health of the Cement Worker*, outlined in detail a practical program for the control of the most important health hazards. This was followed by pictures illustrating methods for stimulating safety activities of workers.

At the second morning session on Wednesday William H. Baker, safety engineer of J. E. Baker Co., York, Pa., reviewed methods which had enabled his company to make a remarkable showing in accident prevention. He stated that in 1925 six men were killed and during a single day there were 13 lost-time accidents, and their total compensation cost for the year was $26,632. But this company, in 1932, had only 5 lost-time accidents, representing a reduction of 98.1 per cent. in accident-frequency rates.

C. E. Ralston, safety director, Pittsburgh Glass Co., speaking on the topic *Safety and the Man*, reviewed methods which had enabled his company to individualize its safety program.

J. B. John, president, Medusa Portland Cement Co., Cleveland, reviewed principles and methods to prove *Why Safety Pays*.

At the first session of the Quarry Section on Tuesday morning Otho M. Graves, General Crushed Stone Co., Easton, Pa., was reëlected general chairman, and the following additional officers were elected:

Vice-chairman, William H. Baker, J. E. Baker Co., York, Pa.; secretary and News Letter editor, V. P. Ahearn, National Sand & Gravel Assn., Washington, D. C.; Poster Committee chairman, H. F. Yotter, General Crushed Stone Co., Easton, Pa.; Publicity Committee chairman, J. R. Boyd, National Crushed Stone Assn., Washington, D. C.; Statistics Committee chairman, W. W. Adams, United States Bureau of Mines, Washington, D. C.; members at large: R. E. Colville, United States Gypsum Co., Chicago, Ill.; Norman G. Hough, National Lime Assn., Washington, D. C.; H. V. Owens, Eastern Rock Products, Inc., Utica, N. Y.; John Prince, Stewart Sand & Material Co., Kansas City, Mo.; A. L. Worthen, Connecticut Quarries Co., Inc., New Haven, Conn.

The Quarry Section program included an entertaining and instructive talk on *Emergency First Aid* by Dr. H. W. Gentles, chairman, First-Aid Life-Saving, Chicago Chapter, American Red Cross.

C. L. Baylor, safety engineer, Louisville Cement Co., Speed, Ind., described the steps which can be taken to control the human element that, in his opinion, causes three-fourths of all industrial accidents. He lists as outstanding mental hazards: stupidity, lack of attention, irritation, worry, physical condition.

Thomas J. Quigley, chief, Inspection Division, Bureau of Mines and Quarries, Pennsylvania Dept. of Labor and Industry, outlined *Safety in Quarrying Operations*.

At the second session of the Quarry Section on Wednesday R. C. Salisbury, Safety Engineer, Hardware Mutual Casualty Co., Stevens Point, Wis., outlined the various factors represented in *The Individual's Responsibility for Safety*.

Wayne Gyger, superintendent, Ottawa Silica Co., Ottawa, Ill., outlined a rather complete manual for providing *Safety in the Quarrying and Grading of Sand*.

During the general discussions in both the Cement and the Quarry Section programs considerable emphasis was placed on the value and necessity of continuous welfare activities among cement workers. At one of these discussions Henry A. Reninger, past president of the National Safety Council, described the welfare activities of the Lehigh Portland Cement Co. of Allentown, Pa., as a part of its program of safety-work service to individual workers and to the community.

Eighteen tons per hour from a No. 19 Crusher–100% through three-eighth inch opening using less than fifteen horsepower

THE following is the result of a test on a No. 19 Kennedy Ball Bearing Gearless Crusher.

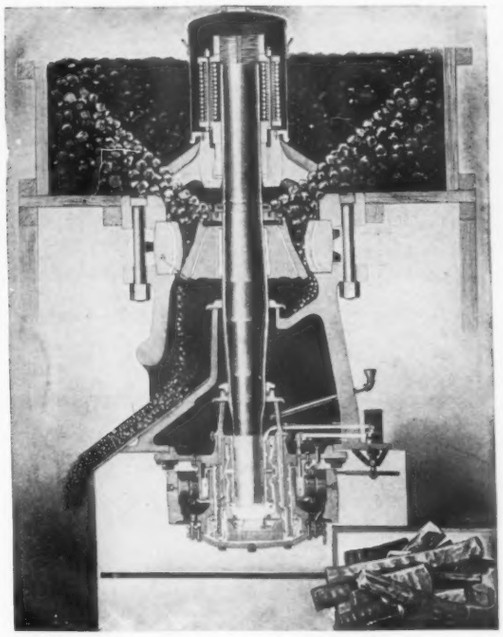
Exceedingly hard glacial gravel, 1½" and plus ⅝", was crushed for sand for concrete purposes, and less than fifteen horsepower was used.

The same crusher can be opened up and 1½" stone can be produced at a rate of from 30 to 50 tons per hour.

With the opening set to ⅛" on the closed side the following results were obtained:

Minus ⅜"	100 %
Plus 3 mesh	21½%
Minus 3—Plus 4	17 %
Minus 4—Plus 14	36½%
Minus 14—Plus 48	15 %
Minus 48—Plus 100	4 %
Minus 100	5½%

This was crushed at the rate of 18 tons per hour.



Built in various sizes with receiving openings from 1¼" to 14". Produces sizes from ⅛" to 3", with capacities up to 620 tons per hour on the larger sizes.

The Kennedy Ball Bearing Gearless Gyratory Crusher is guaranteed to do more crushing, size for size, of any given material, with less power consumption, than any crusher ever built. 90% Of the power input to motor is applied direct to breaking the rock between head and concaves. The head and shaft of the type "S" crusher is suspended on springs to permit tramp steel to pass through. The ball-and-socket eccentric is self-aligning. This crusher may be operated by a synchronous motor, built in the pulley of the crusher, or by belt from standard motor. This crusher takes one-half the power required for a geared crusher, and saves 80% in the cost of maintenance.

We manufacture a complete line of primary jaw and gyratory crushers, ball mills, rod mills, screening, elevating, and conveying equipment, etc. Complete information describing any or all of this machinery will be sent on request. *Send for latest information on our vibrating screen.*

KENNEDY-VAN SAUN MFG. and ENG. CORP.

Two Park Avenue — New York, N. Y.

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Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.

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Universal Road Machy. Co.

Alloys, Steel
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Ash and Refuse-Handling Equipment
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Jeffrey Mfg. Co.

Automatic Feeders
Jeffrey Mfg. Co.

Automatic Weighers
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Belt Fasteners
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Belt Lacing
Flexible Steel Lacing Co.

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Haiss Mfg. Co., Geo.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
Smith Engr. Works
Sprout, Waldron & Co.
Universal Road Machy. Co.

Conveyors (Ready-Mixed Concrete)
Blaw-Knox Co.
Jeffrey Mfg. Co.

Coolers (See Kilns and Coolers—Rotary)

Couplings (Flexible and Shaft)
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Cranes (Crawler and Locomotive)
Bay City Shovels, Inc.
Ohio Power Shovel Co.

Crusher Parts
American Pulverizer Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.

Crushers (Hammer)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

Crushers (Jaw and Gyratory)
Allis-Chalmers Mfg. Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Smith Engr. Works
Universal Road Machy. Co.

Crushers (Ring)
American Pulverizer Co.

Crushers (Roll)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.

Crushers (Rotary)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.

Crushing Rolls
Allis-Chalmers Mfg. Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.

Diesel Engines (See Engines—Diesel)

Dippers and Teeth (Power Shovel)
Bay City Shovels, Inc.

Dragline Cableway Excavators
Sauerman Bros., Inc.

Dragline Excavators
Bay City Shovels, Inc.
Ohio Power Shovel Co.
Sauerman Bros., Inc.

Dredge Chain (See Chain)

Dredge Pipe (See Pipe)

Dredges
Hetherington & Berner, Inc.
Morris Machine Works

Drilling Accessories
Loomis Machine Co.

Drilling Contractors
Mott Core Drilling Co.
Pennsylvania Drilling Co.
Sprague and Henwood Inc.

Drills (Blast-Hole)
Loomis Machine Co.

Drills, Diamond
Mott Core Drilling Co.
Pennsylvania Drilling Co.
Sprague and Henwood Inc.

Drills (Rock)
Jeffrey Mfg. Co.
Loomis Machine Co.

Drills (Well) (See Drills—Blast-Hole)

Drives (Multiple, Belt, Chain, Rope)
Allis-Chalmers Mfg. Co.
Chain Belt Co.

Dryers
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdry. & Mach. Co.
McLanahan and Stone Corp.

Dust Arrestors
Blaw-Knox Co.

Dust-Collecting Systems
Allis-Chalmers Mfg. Co.
Blaw-Knox Co.
Raymond Bros. Impact Pulv. Co.

Dynamite (See Explosives)

Electrical Equipment
Allis-Chalmers Mfg. Co.

Elevator Belting (See Belting)

Elevators (See Conveyors and Elevators)

Engineers
Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.
Sprout, Waldron & Co.

Engines (Steam)
Morris Machine Works

Excavating Machinery (See Shovels; Cranes; Buckets; etc.)

Excavators—Shallow Grading (Bucket Elevator Type)
Haiss Mfg. Co., Geo.

Fans (Exhaust)
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

Feeders
Allis-Chalmers Mfg. Co.
Chain Belt Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Morrow Mfg. Co.
Smith Engr. Works
Sprout, Waldron & Co.

Fuses (Detonating)
Ensign-Bickford Co.

Gaskets
Goodyear Tire & Rubber Co., Inc.

Gasoline Engines (See Engines—Internal-Combustion)

Gates (Bin) (See Bin Gates)

Gates (Clamshell)
Haiss Mfg. Co., Geo.

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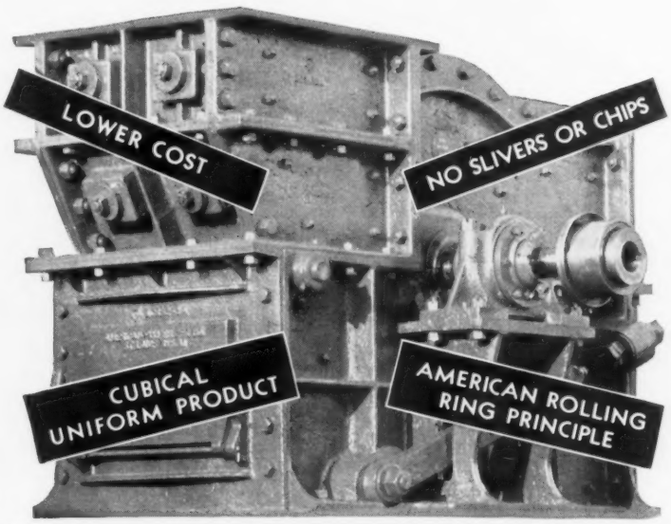

If your crushing costs are not at a minimum, you are THROWING AWAY MONEY. For your plant is inefficient, and your profits are not what they should be. The inefficient and expensive-to-operate crusher should be thrown out and replaced with one built to meet today's needs and costs.

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A few of the outstanding features: Lower first cost; Minimum of fines; Cheap installation cost; Cubical product; Rolling ring principle of crushing.

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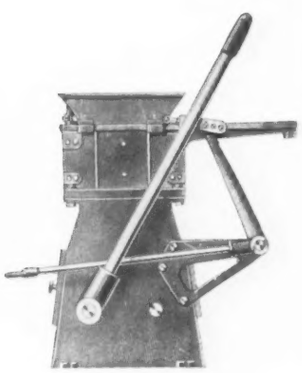
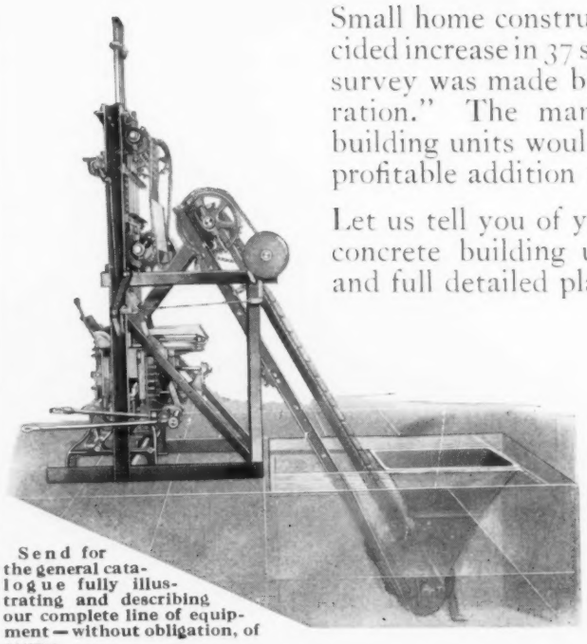
American Pulverizer Company
1289 Macklind Ave. St. Louis, Mo.

ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS

An Allied Business That Makes You Profits





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Let us tell you of your market in making concrete building units, the investment and full detailed plans. Write today.

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MILES MANUFACTURING CO.
Jackson, Mich.

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Index to Advertisers on Page 64

Gears and Pinions
Chain Belt Co.
Haiss Mfg. Co., Geo.
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Gears (Herringbone)
Chain Belt Co.
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Gelatin (See Explosives)

Generators (See Motors and Generators)

Glass Sand Equipment
Lewistown Foundry & Machine Co.

Grab Buckets (See Buckets—Clamshell, Orange-Peel, etc.)

Grating (Steel)
Blaw-Knox Co.
Hendrick Mfg. Co.

Grinding Balls (See Balls, Grinding)

Grizzlies
Allis-Chalmers Mfg. Co.
Eagle Iron Works
Hendrick Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mach. Co.
Smith Engr. Works
Universal Road Machy. Co.

Guards (Wire)
National Wire Cloth Co.

Guns (Hydraulic)
Georgia Iron Works
Hetherington & Berner, Inc.

Hammer Mills (See Crushers—Hammer)

Hoists
Hetherington & Berner, Inc.
Jeffrey Mfg. Co.
McLanahan and Stone Corp.
Sauerman Bros., Inc.
Smith Engr. Works
Sprout, Waldron & Co.

Hoppers
Hendrick Mfg. Co.

Hose (Air, Steam and Water)
Goodyear Tire & Rubber Co., Inc.

Hose Couplings (See Couplings)

Hydraulic Guns (See Guns—Hydraulic)

Idlers
Chain Belt Co.
Jeffrey Mfg. Co.
Smith Engr. Works
Sprout, Waldron & Co.

Kilns and Coolers (Rotary)
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

Lifter Plates
Chicago Steel Foundry Co.

Lime-Handling Equipment
Jeffrey Mfg. Co.
Raymond Bros. Impact Pulv. Co.

Lime Kilns
Kennedy-Van Saun Mfg. and Eng. Corp.

Linings (Ball- and Tube-Mill) (See Mill Liners and Linings)

Loaders and Unloaders
Haiss Mfg. Co., Geo.
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Locomotives (Electric, Gas and Steam)
Lima Locomotive Works

Locomotives (Trolley-Battery)
Jeffrey Mfg. Co.

Magnetic Pulleys See Pulleys, Magnetic

Mill Liners and Linings
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

Mills (Grinding) (See also Crushers—Hammer)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mach. Co.
Raymond Bros. Impact Pulv. Co.
Sprout, Waldron & Co.

Motor Trucks
General Motors Truck Co.

Motors and Generators
Allis-Chalmers Mfg. Co.

Motors (Internal-Combustion) (See Engines — Internal-Combustion)

Nozzles (Hydraulic) (See Guns—Hydraulic)

Packing
Goodyear Tire & Rubber Co., Inc.

Partitions (Wire)
National Wire Cloth Co.

Perforated Metal Plates
Allis-Chalmers Mfg. Co.
Chicago Perforating Co.
Hendrick Mfg. Co.
Morrow Mfg. Co.
Sprout, Waldron & Co.

Pipe Flanges
Georgia Iron Works
Hetherington & Berner, Inc.

Plug Valves (See Valves)

Pneumatic Drills (See Drills, Rock)

Portable Conveyors
Haiss Mfg. Co., Geo.
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Portable Crushing and Screening Plants
Jeffrey Mfg. Co.

Portable Engines (See Engines—Internal Combustion)

Portable Loaders (See Loaders and Unloaders)

Power Shovels (See Shovels, Electric, Internal-Combustion and Steam)

Pulleys (Magnetic)
Sprout, Waldron & Co.

Pulleys (Wing)
Sprout, Waldron & Co.

Pulverized Fuel Systems
Gay, Rubert M.
Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulv. Co.
Universal Road Machy. Co.

Pulverizers (See also Crushers; Mills; etc.)
American Pulverizer Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Raymond Bros. Impact Pulv. Co.

Pump Valves (See Valves, Pump)

Pumps (Cement Slurry)
Morris Machine Works

Pumps (Centrifugal)
Allis-Chalmers Mfg. Co.
Chain Belt Co.
Georgia Iron Works
Hetherington & Berner, Inc.
Morris Machine Works

Pumps (Dredging)
Allis-Chalmers Mfg. Co.
Georgia Iron Works
Hetherington & Berner, Inc.
Morris Machine Works

Pumps (Sand and Gravel)
Allis-Chalmers Mfg. Co.
Georgia Iron Works
Hetherington & Berner, Inc.
Morris Machine Works

Purifiers, Steam (See Steam Purifiers)

Ready-Mixed Concrete Plants
Chain Belt Co.

Rock Drills (See Drills—Rock)

Rod Mills
Kennedy-Van Saun Mfg. and Eng. Corp.

Roller Bearings
See Bearings, Roller

Rope (Wire) (See Wire Rope)

Sand Separators
Jeffrey Mfg. Co.
McLanahan and Stone Corp.
Smith Engr. Works

Sand-Settling Tanks
Jeffrey Mfg. Co.
Smith Engr. Works

Scrapers (Power Drag)
Sauerman Bros., Inc.

Screens
Allis-Chalmers Mfg. Co.
Chain Belt Co.
Chicago Perforating Co.
Deister Concentrator Co.
Deister Machine Co.
Eagle Iron Works
Gay, Rubert M.
Haiss Mfg. Co., Geo.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
National Wire Cloth Co.
Productive Equip. Corp.
Smith Engr. Works
Sprout, Waldron & Co.
Universal Road Machy. Co.

Screens (Vibrating or Shaking)
Allis-Chalmers Mfg. Co.
Deister Concentrator Co.
Deister Machine Co.
Gay, Rubert M.
Jeffrey Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
McLanahan and Stone Corp.
Productive Equip. Corp.
Smith Engr. Works
Sprout, Waldron & Co.
Universal Road Machy. Co.

Separators (Air) (See Air Separators)

Sheaves
Allis-Chalmers Mfg. Co.
Chain Belt Co.
Eagle Iron Works
Haiss Mfg. Co., Geo.
Hetherington & Berner, Inc.
Jeffrey Mfg. Co.
McLanahan and Stone Corp.
Sprout, Waldron & Co.

Shovels (Electric, Internal Combustion and Steam)
Bay City Shovels, Inc.
Ohio Power Shovel Co.

Silos
Chain Belt Co.

Skip Hoists and Skips
Allis-Chalmers Mfg. Co.
Chain Belt Co.
Hetherington & Berner, Inc.
Jeffrey Mfg. Co.

Speed Reduction Units
Chain Belt Co.

Spouts (See Chutes and Chute Liners)

Sprockets and Chain
Chain Belt Co.
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Stackers
Jeffrey Mfg. Co.

Steel (Alloy)
Chain Belt Co.
Chicago Steel Foundry Co.

Steel Grating (See Grating, Steel)

Steel Inclines (See Inclines, Steel)

Steel Plate Construction
Hendrick Mfg. Co.
Hetherington & Berner, Inc.
Sprout, Waldron & Co.

Storage Equipment
Chain Belt Co.
Haiss Mfg. Co., Geo.
Jeffrey Mfg. Co.
Sauerman Bros., Inc.

Tanks
Hendrick Mfg. Co.

Tanks (Sand-Settling)
Jeffrey Mfg. Co.
Morrow Mfg. Co.
Smith Engr. Works

Tools (Drill) (See Drilling Accessories)

Tractors
Allis-Chalmers Mfg. Co.

Trailers
Bay City Shovels, Inc.
General Motors Truck Co.

Transformers
Allis-Chalmers Mfg. Co.

Transmission Belting (See Belting)

Transmission Machinery
Allis-Chalmers Mfg. Co.
Chain Belt Co.
Jeffrey Mfg. Co.

Trippers
Chain Belt Co.
Jeffrey Mfg. Co.

Truck Cranes (See Cranes)

Truck Mixers
Blaw-Knox Co.
Chain Belt Co.

Trucks and Trailers (See Motor Trucks)

Tube-Mill Liners (See Mill Liners and Linings)

Tube Mills (See Mills—Ball, Tube, etc.)

Underground Loaders
Allis-Chalmers Mfg. Co.

Unloaders (Box Car)
Chain Belt Co.
Jeffrey Mfg. Co.

Variable Speed Reducers or Transmissions
Chain Belt Co.

Vibrating Screen Plate
Chicago Perforating Co.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Morrow Mfg. Co.

Vibrating Screens (See Screens—Vibrating)

Washers (Sand, Gravel, and Stone)
Allis-Chalmers Mfg. Co.
Eagle Iron Works
Haiss Mfg. Co., Geo.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
McLanahan and Stone Corp.
Smith Engr. Works
Universal Road Machy. Co.

Weighing Equipment (Automatic)
Blaw-Knox Co.

Well Drills (See Drills—Well)

Wheels (Car)
Eagle Iron Works

Winches and Capstans
Chain Belt Co.
Jeffrey Mfg. Co.
Sprout, Waldron & Co.

Wire Cloth
National Wire Cloth Co.

Wire Rope
Leschen & Sons Rope Co., A.
Williamsport Wire Rope Co.

Wire-Rope Fittings
Leschen & Sons Rope Co., A.
Williamsport Wire Rope Co.

Wire Rope Slings
Leschen & Sons Rope Co., A.
Williamsport Wire Rope Co.

Worm Gears (See Gears and Pinions)

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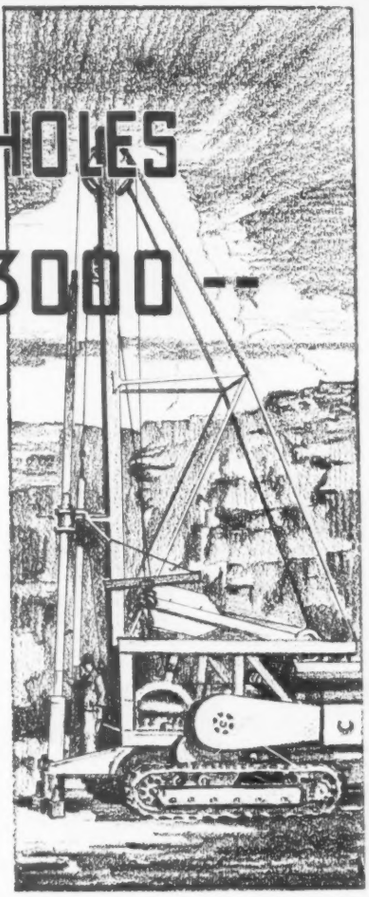
Universal Road Machinery Co.

Kingston, N. Y.

3 HOLES *or* 3000 --



It's all the same to CORDEAU

A line of Cordeau-Bickford Detonating Fuse, extending from the bottom to the top of each hole, will detonate the entire charge practically simultaneously, *yet permit relief of burden*, resulting in better fragmentation. Furthermore, each cartridge has the added strength of a primer cartridge because it is detonated directly by the Cordeau. This means more work from your explosives.

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Simsbury, Conn.

CB23

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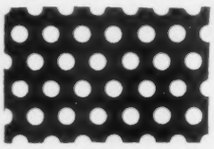
BICKFORD



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Full range of sizes.

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ELEVATOR BUCKETS

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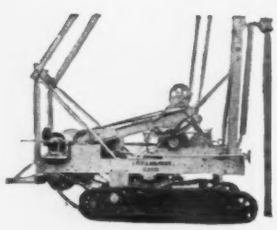

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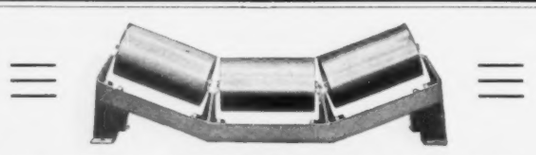

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Tight Butt Joints

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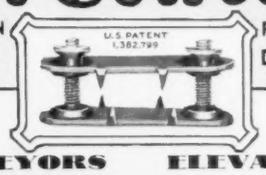

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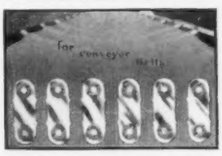
CONVEYORS ELEVATORS



THE recessed plates embed in the belt and compress it instead of pulling against the bolt holes. This provides great surplus strength. It equalizes the pull throughout the plies. Keeps belt ends intact avoiding trouble. FLEXCO HD Belt Fasteners are in extensive use throughout many industries, giving long reliable service wherever tight butt joints are desired. Made in steel and in monel metal. Sold by jobbers and belting houses in 5 sizes. Recommendations supplied gladly.

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HD

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BARGAINS

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FACTORY REBUILT

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SHOVELS, DRAGLINES and CRANES

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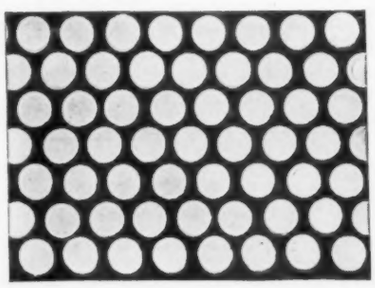
IF your work demands additional loading or stripping equipment; or if your present shovel, dragline or crane is no longer efficient, then it will be to your advantage to write for further information and prices of these good-as-new machines. They are offered in ¾ to 1½ yard capacity. Each machine carries a new machine guarantee. Each machine is convertible into crane, dragline or shovel. Write today.

The Ohio Power Shovel Company
Division of Lima Locomotive Works, Incorporated
LIMA, OHIO, U. S. A.

MORROW SCREEN PLATES



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A complete set of punches and dies covering a wide range of sizes, in round, square, oval and diagonal slots are ready for the press, insuring prompt delivery of orders.

Prices are right.
Send for Bulletin 57.

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Wellston, Ohio

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George Haiss Manufacturing Co., Inc.
142d St. & Rider Ave., New York, N. Y.
Builders also of HAISS ELEVATORS—SCREENS—CLAMSHELL BUCKETS

The PIT AND QUARRY Employment Service for subscribers has registered the following applicants for positions. Perhaps you have an opening in your organization for one of these men. If so, PIT AND QUARRY will be pleased to put you in touch with the applicant if you will advise us which one fills your requirements.

4. Stone Quarry Supt. or Supt. asst. 12 yrs. experience in commercial stone and railroad ballasting; operating and repairing all kinds and makes of equipment. Wide experience in drilling and blasting. A-1 references.

9. Quarry foreman, 6 years' experience.

10. Superintendent; 10 years' experience; lime and stone.

11. Superintendent crushed stone; 25 years' experience.

12. 10 years' experience in production of crushed gravel and sand; design engineer and builder; general superintendent; has had some sales experience. Experience covers the entire field.

14. Thoroughly experienced superintendent who has also in the past been assistant superintendent and foreman of granite and lime quarries; at present not employed.

15. General Manager or Superintendent with 8 years' experience in hydraulic sluicing operations applied to stripping and mining of sand and gravel and large excavation and fill work. This is the cheapest and most powerful excavation and transportation agent known where plentiful water supply and height of deposit and gravity are available. If you have such a deposit or problem with the necessary natural features, your costs under other methods can be tremendously reduced. Capable executive, technical graduate, long experience, age 42, married. Especially valuable to organization contemplating recovery of sand, gravel and gold from placer deposits. References.

16. Superintendent, 30 yrs. experience, mine, mill and quarry and large shovel operations, thorough knowledge of various systems of underground and open pit mining. Development work from grass roots to mill construction and operation, copper, iron, zinc and non-metallics, 4 yrs. special work in asbestos, mica and kaolin, good organizer and good production and safety record but not a college graduate. South, Southwest or Tropics preferred.

18. Superintendent of stone crushing and sand and gravel plant with considerable experience in operation of dredges, draglines, electric and steam shovels, all kinds of crushing, conveying, screening equipment. Can furnish excellent references, good record and details of past experience.

19. Electric Shovel Operator with considerable experience. Also power-house and general electrician, maintenance, welding, repairing gasoline truck motors, crushers, screens and various kinds of equipment.

20. Crushed stone superintendent since 1903; prefer West or Southwest territory; thoroughly experienced in construction and operation of plants, know how to get best results from the quarry end.

21. Cement plant superintendent or heavy limestone quarry; 20 years' experience in construction and operating plants.

24. Superintendent, stone quarry or slag plant 16 years office and operating experience.

25. Dragline, Crane and Shovel Operator, 9 years' experience in steam and 3 years on electric shovel (Marion), desires position as operator. Can do own repairing. Permanent connection desired. Married. References furnished. Will go anywhere, but a location near good schools preferred.

26. Operator with 5 years' experience on Link-Belt and Koehring cranes. Also 7 years' experience in sand and gravel pit. Available now. Go anywhere.

27. Laboratory work, 3 years' experience as Asst. Chemist doing control and analytical work. College graduate, B. S. degree.

12 years' experience as cement burner and night foreman and watchman.

29. 14 years' practical quarry experience, office, sales, management, superintendent, reconstruction, etc. Open for new connection with progressive company, preferably sand and gravel concern.

30. Crushing plant and quarry Superintendent. Experience includes erecting, rebuilding and repairing machinery. Successful in organizing labor for economy. References furnished.

32. An overhead traveling bridge crane man. Experienced. Can give good references. Willing to go anywhere.

34. Capable man. 53 years old. Married, experienced in quarry and crushing plant, timekeeping, payroll and plant office work, seeks position as assistant superintendent, general foreman or plant office work, where experience and loyalty will be appreciated. Will not be interested in investing money at the present time in any position. Have you an opening?

35. Superintendent of crushing and quarrying plant. 14 yrs.' experience in cement business, including changing plants from dry to wet process. Can furnish references.

36. Cement Mill Chemist with 4 years of cement mill work on both wet and dry processes, and 8 years of wide experience in organic analytical work covering all problems incidental to the manufacture of cement.

38. Position wanted as manager or superintendent with a progressive crushed stone Company, where ability and experience would be appreciated. 39 years of age. 20 years' practical experience in large open pit mines and crushed stone plants. Familiar with latest type high speed reduction crushers. Have always maintained low production costs. Can furnish unquestionable references. Location immaterial.

39. Ten years experience as Burner man; reliable. Age 37. Desires position where ability and skill will be appreciated by advancement. Available immediately.

42. General superintendent or manager; expeedrienc graduate engineer.

43. Sales Engineer desires making change, preferably New England territory. 20 yrs. experience with a reputable concern designing, estimating and selling material handling equipment in all phases. Broad acquaintance among executives and buyers.

44. Want position as carpenter or millwright, capable of taking charge of gang. Steady work preferred with cement company.

45. Operator with ten years' experience on Bucyrus-Erie Steam and P. and H. Gas Shovels in grading, gravel pit and stone quarry work. Can furnish references.

46. Gravel plant supt. or manager. 10 yrs. supt. of large railroad and truckiag plants. Experienced in erection and care of gravel plant equipment. Can furnish best of references. Services available at once. Will go anywhere.

47. Graduate Engineer. 25 yrs'. experience as designing, constructing and operating Engineer, as well as Supt. of stone crushing and gravel washing plants, also heavy rock blasting.

48. Graduate Engineer. Wide experience as mining, consulting and sales Engineer, in charge of all outside operations, construction and maintenance. A-1 references.

49. 15 yrs'. experience in erecting and operation, crushing, grinding, washing, drying, screening and separation plants. Know value of low production costs. Good references.

50. Gravel Plant Supt. 7 yrs'. experience erecting and operating gravel plant equipment for large manufacturer. 2 yrs. in charge of mining operations in Brazil. Best of references.

52. Past experience with Crushed Stone and Sand and Gravel plants; in sales, can figure with contractors, scales, cost, timekeeping, bookkeeping, general all-around man.

54. Engineer experienced in Mechanical, Structural, Electrical, Plant Design and Layout, Estimating, Field work, Maintenance and Millwork desires position. Will locate anywhere.

55. Superintendent of crushed stone products plant and quarry. Twenty years' experience in this and foreign countries in charge of operations. Familiar with modern up-to-date methods and profitable application of same.

56. Master Mechanic, thoroughly trained in the upkeep of crushers, steam shovels, gas and diesel equipment, etc. Reference and complete information on request.

58. Position as Superintendent by graduate Mining Engineer. 35 years old with wide operating experience in large open pit mines and crushed stone plants up to 10,000 tons. Thoroughly experienced in Quarry layout, development, heavy blasting, shovel loading, transportation and mill design and operation, electric or steam power, and with latest type high speed reduction crushers, screen analysis of a sampling and grading of specification stone.

59. 13 years' experience in general office work, including correspondence, sales and operations. Well acquainted with freight rate structures on crushed stone, sand and gravel and cement. Desire connection with any concern where ability and experience would be appreciated.

Can You Use THESE MEN ?

Employment Dept.
PIT AND QUARRY
538 So. Clark St. Chicago, Ill.

60. Slackline Cableway operator. 5 years' experience. Can keep cableway operating at full capacity Can do repair work. Had experience raising and lowering mast or tower. Can do all necessary rigging around cableway.

62. Position wanted as quarry superintendent. Prefer southwest or west coast.

63. Stone Quarry Supt. or Supt. asst. 14 yrs. experience in commercial stone and railroad ballasting; operating and repairing all kinds and makes of equipment. Wide experience in drilling and blasting. A-1 references.

64. Position wanted by operator with 15 years' experience on cranes, shovels, draglines, sand pumps, dredges, etc. 35 years of age, can furnish A-1 references. Will go anywhere.

67. Successful manager of stone crushing plants, also sand and gravel pits, desires position where previous experience will prove of mutual benefit. Can also sell sand, gravel and stone products or machinery and electrical equipment.

68. Superintendent and Foreman with wide experience in operation of slag, sand and gravel and stone plants. Also experience in railroad work, road construction, grading, ditching, bridges, concrete work, all kinds of excavation, government inspection. Can operate gas and electric cranes. Best of references.

69. Engineer and draftsman, fifteen years' experience, machinery design; structural; plant layout, development, thoroly acquainted with architectural and mechanical design. Technical graduate, also business management and administration course, Alexander Hamilton Institute. Field and office experience. Age 37 years. References.

70. Office man, 10 years' experience in general office work, payrolls, costs, and operations. 9 years with Gypsum Co. Age 30, married, and A-1 references. Will locate in Eastern and Middle States. Prefer lime, cement, and gypsum concerns. Available immediately.

71. Superintendent. Several years' experience in open cut mining. Can handle any open cut proposition, having had charge of some of the largest operations in Tennessee, Kentucky and New York State. Five years' experience as superintendent of sand and gravel plant. Can furnish good references.

72. Superintendent, stone quarry. 24 years' experience in building line and quarrying. Last 3 years with a Wisconsin quarry as superintendent, estimator and layout man for cut stone work. Can handle the quarrying and production of stone for veneer and cut stone, also crushing. Can furnish excellent references.

73. Blacksmith and tool sharpener. 20 years' experience. First class. Can sharpen by hand or machine; can also do quarry work; stone cutters sharpening. Can give first class references.

74. Shovel or Crane Operator, 25 years' experience on different types and makes of excavating machinery; gas, steam, electric and Diesel powered. Will go anywhere.

75. Superintendent—employed for six years by sand and gravel company wishes to leave present position. Familiar with both large and small gravel and stone plants, having been in the materials department of the highway commission of a midwestern state for 7 years, located at various plants with different types of operation.

Specializing in castings for cement mills and kindred lines.

PYRASTEEL for high temperatures

EVANSTEEL for strength

Experienced engineering service available at all times.

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ONE YARD BAY CITY ON HEAVY-CUT, STATE HIGHWAY JOB
This Machine, with chain crowd, frictionless (New Departure) Bearings and Bay City modern design handled an average of 100 yards per day MORE than a competitive 1¼ yard machine on the same job and same working conditions.

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⅜ yd. Tractor Shovel
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½ yd. Standard Model 30
½ yd. Heavy Duty Model K-2
¾ yd. Standard Model 42
¾ yd. Heavy Duty Model 52
1 yd. Special Model 52
1 yd. Heavy Duty Model 62
1¼ yd. Special Model 62

MODERN DESIGN
Honestly Advertised—Fairly Priced
—FOR 20 YEARS—
Builders of Dependable Shovels—Cranes—Dredges
BAY CITY SHOVELS, Inc.
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Member—Shovel, Dragline and Crane Institute
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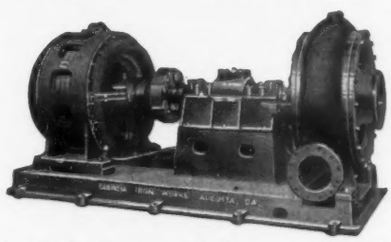
SAND AND DREDGING PUMPS



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Spiral Screw and Log Washers, De-Waterers and Shale Removers, Flume Classifiers, Swintek Ladder Suction Screen Nozzles, Chain Type Cutters, Barges and Pontoons, A Frame and Gantry Hardware, Vibrating and Revolving Screens, Steel Dump Cars, Grizzlies, Car Wheels and Trucks, Steel Bins, Water Tanks, Structural Towers, and Dry Pans.

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Genuine Spring Steel Wire Cloth in Double and Lock Meshes
IMMEDIATE SHIPMENT FROM STOCK
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Complete electrically equipped gravel plant outfit including 10-inch pump, ½-yard bucket and railroad switch. Offered for sale in whole or in parcels at place of business of the undersigned Nov. 7 to 10th inclusive from 9 A. M. to 3 P. M. If not sold Trustee will continue to offer for sale from day to day.

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HI-GRADE-REBUILT

Motors, Generators, Transformers, Meters, Exhaust Fans, Blowers, Pumps, etc. All standard makes and sizes. Rock bottom prices. Money-back guarantee.
Write, phone or wire
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Crushing Plants; Diesel, Gasoline, Electric Cranes and Shovels; Hoists; Compressors; Pumps; Dragline and Excavating Equipment; and all sizes and types of Jaw, Gyratory and Roll Crushers; Swing Hammer Mills; Elevators; Belt Conveyors; Rotary and Vibrating Screens; Rotary Kilns and Dryers; Raymond and other fine Pulverizers; Air Separators; Hardinge Ball and Pebble Mills; Silex and Iron lined Tube Mills, etc. Send for Bulletin No. 14.

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Tel. Barclay 7-0600 Shops and Yards at Newark, N. J., now cover eight acres

MOTOR BARGAINS
3 PHASE, 60 CYCLE

HP	Make	Volts	Type	Speed
1-800	G. E.	2300	Slip Ring	720
1-600	G. E.	440	Synch.	360
1-300	Al. Ch.	2200	Slip Ring	585
1-275	G. E.	550	Synch.	900
2-200	G. E.	2200/440	Synch.	514
1-200	Wsthse.	440	Slip Ring	500
1-200	F. M.	440	Slip Ring	600
1-200	Wsthse.	220/440	Sq. Cage	585
1-150	G. E.	550	Synch.	720
1-104	G. E.	220/440	Slip Ring	870
1-100	Wsthse.	220/440	Slip Ring	575

Motors—Generators—Transformers and Other Electrical Equipment
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Steam Locomotives

All Equipped ASME Boilers

70-ton Porter 6-wheel saddle tank.
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40-ton American 4-wheel saddle tank (2 duplicates).
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28-ton Vulcan 4-wheel saddle tank.

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25-ton 4-wheel Plymouth.
8-ton 4-wheel Plymouth.
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1—No. 175 B Bucyrus Steam Shovel
15—30 Yd. Std. Ga. Air Dump Cars
60 Caterpillar Tractor
75 Monarch Allis-Chalmers Tractor
No. 8 Austin Gyr. Crusher
4—1¼ Yd. Maney Scrapers
Type B Erie Comb. Shovel & Crane
One Yard Massillon Steam Shovel
12 Ft. Galion Leaning Wh. Grader
Half Yard Northwest Shovel
No. 105 Northwest Comb. Shovel & Crane

Derricks, Pumps, Boilers, Gas Locomotives, Steam Locomotives, Gravel Plants, Rollers, Forms, Finishers. ALL KINDS OF EQUIPMENT. TELL US WHAT YOU WANT.

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Symons Cone Crushers, 7'-4'-3'-2'.
Allis Jaw 48x36-24x36-12x24.
Traylor & Farrel 36x42-42x48-24x36.
Cedar Rapids 14x36-9x36-8x10-6x8.
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Champion Portable 7½x13 with Elevator.
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Marion Electric Shovels 1½ and 3 to 4 yds.
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Northwest Crane and Dragline 45' Boom.
Plymouth 20 Ton, Vulcan 8 Ton Locomotives.
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Universal Truck Cranes, Buckets, Conveyors, Screens, Power Equipment, Boilers, etc.

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1—25 ton Ohio locomotive crane 50' boom, D.D. A.S.M.E. boiler.
1—25 ton Ohio locomotive crane 50' boom, S.D. A.S.M.E. boiler.
1—Vulcan 40 ton S.G. Saddle tank locomotive A.S.M.E. boiler.
1—Baldwin 75 ton Switcher.
1—Chicago gas driven portable 220' compressor.
1—Link-Belt 1¼ yd. Shovel, 50' crane boom.
1—Browning shovel ⅝ yard with 35' crane boom.
1—Lorain 1¼ yard shovel and 50' crane boom.
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1—Buffalo ten ton gas roller.
1—Marion steam crane 40' boom on caterpillars.
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2—9B2 McKiernan-Terry hammers.
1—No. 7 McKiernan-Terry hammer.
1—⅝ yd. Haiss Clamshell Bucket.
2—1 yd. Hayward Clamshell Buckets.

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40—Rex-Stern Return Idlers, Roller Bearing, 20 in. $2.00 Each.
No. 2 Chambers Clay Disintegrater Crusher, Type PD 122, 16 in. $350.00.
12 in. Pulverizer, motor drive, $165.00.
Bauner Pulverizer, Type U53, $40.00.
Nichols Herreshoff Furnace complete with Blowers, Gas Blower, Speed Reducers. Price upon application.
Screw Conveyors, Bucket Elevators, Hangers, Clutches, Wooden Tanks, and Agitators.

Superior Electric Machinery Co.
253 North Third St. Philadelphia, Pa.

For Sale

1—No. 7½ McCully Crusher.
1—No. 6 Smith Crusher.
1—No. 5 Austin Crusher.
1—10" Superior McCully Crusher.
1—8" Traylor Crusher.
2—No. 3 Gates Crushers.
1—6" Superior McCully Reduction Crusher.
1—48" Symons Horizontal Disc Crusher.
Several Jaw Crushers.
Gas and Electric Motors, 1 HP to 200 HP.
1—Clipper Well Drill.
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1—15-ton Steel Stiff Leg Derrick, 80-ft. boom, 38-ft. mast—in A-1 condition.

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5—40-ton American and Baldwin 4-Driver Saddle Tank Locos., built 1926 and 1929.
1—20-ton and 3 8-ton Vulcan std. ga. Gas Locos.

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12-yd. Western Air, also Hand Dump Cars, Flats, Gondolas, Steel Hopper Cars, Box Cars.

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FOR SALE

1—110' boom Steel Stiff Leg Derrick, 1½ yd. bucket	$1500.00
1—3-drum Clyde Hoist, 9 x 10 with boiler and independent swinger	500.00
1—35' center belt Bucket Elevator 14 x 15 x 26" buckets	350.00
2—25-ton Browning Locomotive Cranes, new 1929, perfect condition, Each	6000.00
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ANALYZE THIS INDUSTRIAL LIME ROCK PICTURE

120 Acre: Quarry.

Content: 98% lime.

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Its Motor, G. E. 150 H.P., 3 Ph., 60 C., 220 V., 750 R.P.M.	450.00
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Steel Hopper Structure, Loads 2 cars at one time	1,000.00
95—30"x15"x12" Bucket Elevator, 128' 32" Rubber Belt, Complete.	450.00
Loco. Crane, R. R. Type, Link-Belt Elect., 99', 5-Yd. Bucket.	5,000.00
Clam Shell Bucket, 5-Yd., separately.	1,250.00
Thew Elect. Shovel, S/G, 4-Wh., 1½ Yd., 1 Yd. Dipper.	800.00
Diesel Engine Generator Sets, Two, Fulton-G. E., 520 H.P., 350 K.W., 164 R.P.M., 2300 V., 3 Ph., 60 C., Complete. Location Mo. .....For Both	20,000.00

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355 cu. ft., 100 lbs. ER-1, Ingersol Rand Belted.
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Have available Compressors and Oil Engines.
We Buy Compressors and Oil Engines for Cash.

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One Byers Bear Cat combination shovel, scraper, skimmer, ditcher and back filler. Shop No. 3808. Caterpillar tread. Length of boom; maximum 27' 6", minimum 12' 6". Boom stroke 15'0". Adjustable trench bucket. One-half yard skimmer bucket.

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Used Equipment

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½-Yd., Mead-Morrison Gas, Crawler Shovel.
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DIESEL DRAGLINE

1¼-Yd., Bucyrus-Erie Diesel Dragline.

DUMP CARS

24, Western, 4-Yd., 36" Gauge Dump Cars Heavy Duty, Steel Beam Type.

NEW AND USED

Steam, Gas and Electric Locomotives
Locomotive and Crawler Cranes.

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12, 16, and 20-yd. Side Dump Cars.
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1-yd. Link-Belt Cranes and Draglines.
1-yd. Northwest Shovel-Draglines.
Also general construction equipment.

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Thoroughly modern equipment of all kinds for the Nonmetallic-Mineral Industry. See our advertisement September issue.

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GUARANTEED 100% PERFECT

Considerably below market prices.
20 ton ⅞-in. Hexagon.
50 ton ⅞-in., 1-in., 1⅛-in., 1¼-in., and 1⅜-in. Round, Hexagon and Quarter Octagon.

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LIQUIDATION BARGAINS

One Sullivan Angle Compound Compressor, size 16x9¾x10, 550 cu. ft. Used on one job. Guaranteed good as new for all practical purposes.....$1000.00

1¼ yd. P & H Gas Cat Shovel. No. 600. New 1929. Price.....$2000.00

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AIR COMPRESSORS
Portable and stationary, belt, with elec. or gas. power, sizes from 21 cu.ft. to 2000 cu.ft. All A.S.C.E.

BUCKETS
246—Buckets, all sizes and makes.

CARS
Large lot including std. ga. 6, 12-yd. and 20-yd. 36-ga. 5-yd. and 24-ga. 1½-yd. Also std. ga. flat cars and ballast cars.

CONVEYORS & ELEVATORS
9—Portable Belt Conveyors with steel frame, gas or electric power 18" and 24" Barber Greene and Chicago Automatic.

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We have located, inspected and have under option, nearly a hundred crushers, all sizes and types, including:
DISC CRUSHERS — JAW CRUSHERS
GYRATORY CRUSHERS — HAMMER MILLS
ROLL CRUSHERS
1—No. 5½ Symons coarse cone type.

SPECIAL OFFER
CRANES AND DRAGLINES (crawler mounted)

1—Link Belt K-55 No. 1450 dragline; 70 ft. boom; 1½-yd. Page dragline bucket; Atlas 4-cyl. Diesel engine.

1—Northwest Mod. 104, 45 ft. Boom. 1¼ yd. dragline or clamshell. Serial 1754.

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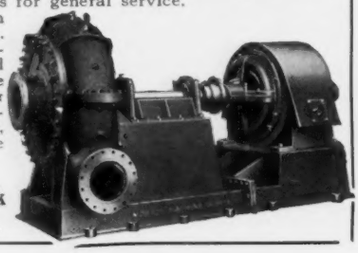

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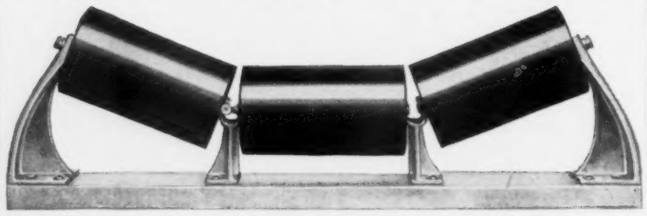

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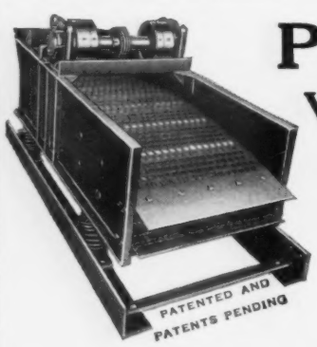

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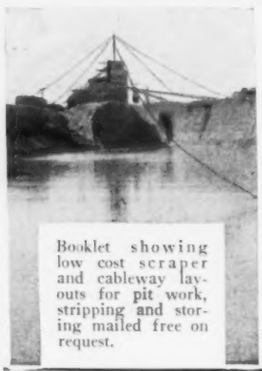

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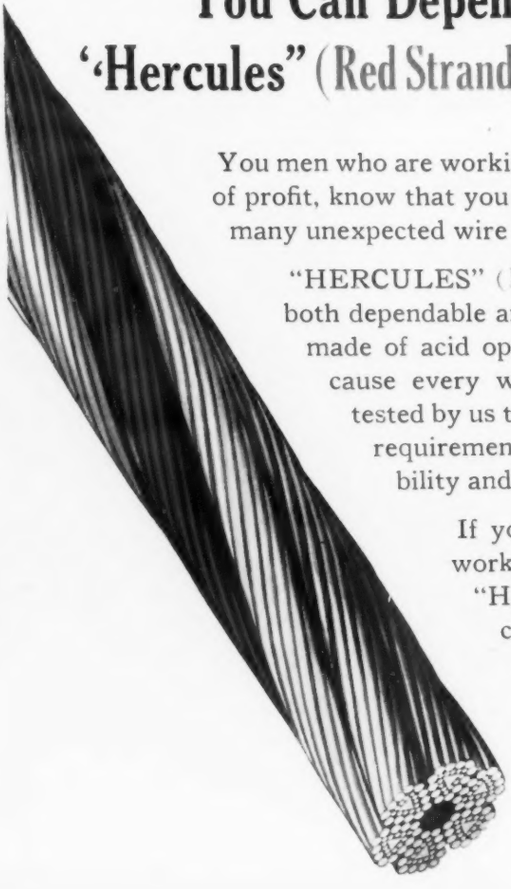

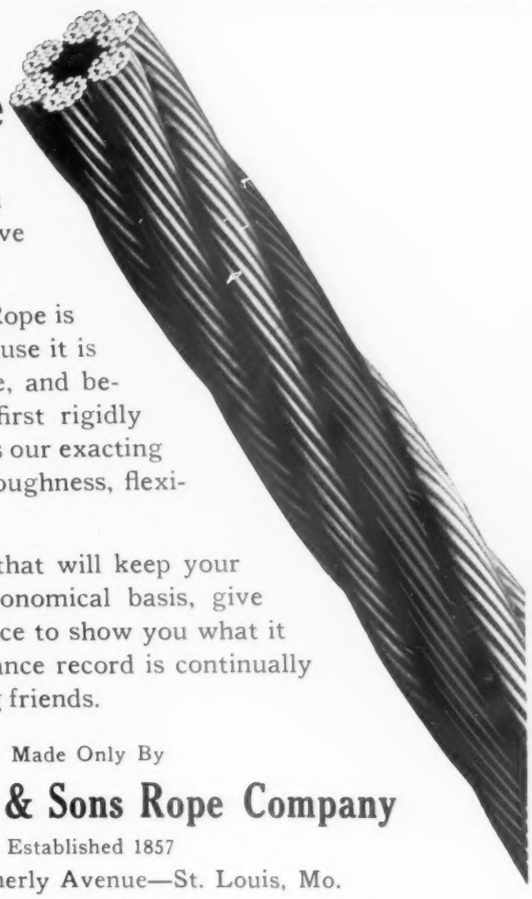

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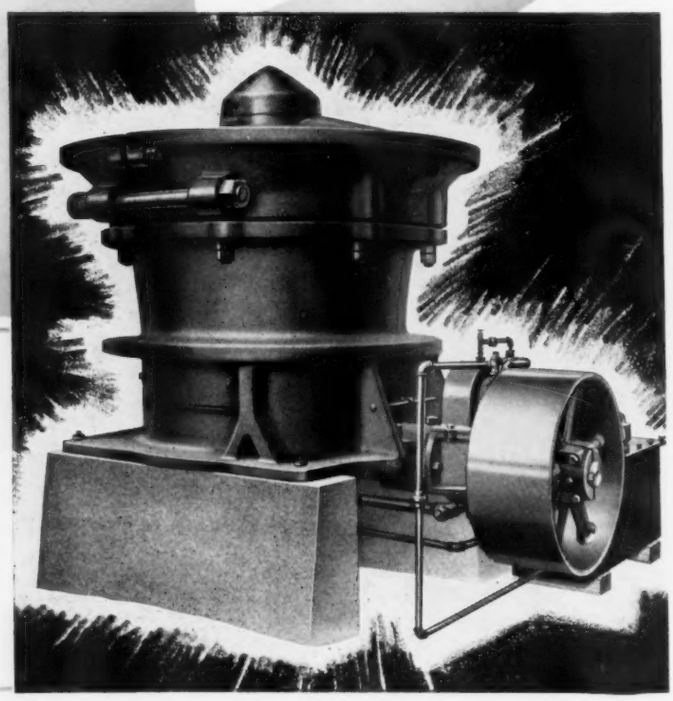
STEEL CROWN

UNBREAKABLE SHAFT



ALL THREE VITAL PARTS GUARANTEED AGAINST BREAKAGE EVEN BY TRAMP IRON

BC-26

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